

The MILLING WORLD

and CHRONICLE OF THE GRAIN and FLOUR TRADE.

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Wolf & Hamaker's New Works, CHAMBERSBURG, PENN.

WE present herewith a bird's eye view of the new and commodious works of Messrs. Wolf and Hamaker, mill builders, contractors and general mill furnishers, located at Chambersburg, Pa. The works at Allentown, where the business was formerly conducted, having become too small for their trade, the citizens of Chambersburg induced the firm to locate among them, by making a very liberal offer in the way of shops and water power, besides a bonus of several thousand dollars in cash. The location is in the beautiful Cumberland Valley, one of the finest wheat growing sections in the country. It possesses excellent shipping facilities, and is within easy access of all the principal trading points both north and south. The main building, as shown in the cut, is 165 feet long by 50 feet wide, and three stories high, and is divided as follows for the different branches of the business: The first floor contains the machine shop and planing mill, together with the several offices, drawing rooms and a department with power sewing machines for making up bolting cloths, in which the firm have a large and increasing trade. The second floor is used as pattern shop and wood-working department generally. Here the bolting and scalping chests, purifiers, etc., are manufactured and the third floor is used for the lighter wood work department and for the storage of finished machinery and work. The establishment is run by water, a large Keiser turbine furnishing the power, but ample provision is made to drive by steam in case of drouth. The buildings are heated throughout by steam which is supplied by two tubular boilers 48 inches in diameter by 16 feet long and is conducted through several thousand feet of inch and a half and two-inch pipe to obtain the necessary heating surface. The foundry and smith shop are large and well arranged and adapted for all kinds of mill work, light and heavy. There is also a large storehouse for patterns, sand and supplies beyond the foundry and a large building opposite it for housing a heavy stock of lumber, also a dry kiln, boiler and engine rooms, water house and buildings. The firm have recently succeeded in obtaining exclusive control of the Keiser turbine and have secured the services of Mr. Keiser formerly manager of the Keiser Machine Co. as superintendent of the works, and besides the turbine the firm will manufacture as heretofore their celebrated Wolf & Hamaker's improved middlings purifier, their new improved bolting chest, scalping chest and bolting cloths, and do general foundry and machine work. They will also contract for the erection and entire work of new mills, for the remodeling of old ones and will be pleased to furnish anything whatever that goes into a mill, or information, advice or estimates on same. The firm consists of Augustus Wolf and David L. Hamaker, both members being practical men, Mr. Wolf is a thorough millwright and

builder of long and varied experience and is the head millwright and general traveling man, and Mr. Hamaker is a practical miller and business man of undoubted ability and is the general business manager. They have surrounded themselves with men who are most thoroughly posted in their respective branches, and if their star follows them as heretofore, and it bids fair to, they will with the increased advantages of cheap production and transportation, in a few years, rank second to none of the establishments doing business in this line.

A TREATISE ON FLOUR.

V.

If bran is treated with boiling water, the resulting fluid does not exert any action upon the gluten. A particular kind of flour, after being kept during three hours at a temperature of 176° F. had lost 6.5 per cent. of its moisture and gave 26 per cent. of gluten. The same flour heated for three hours at 212 degs. lost 11.4 per cent. water and gave 26.6 per cent. gluten. After being subjected to the latter temperature for eight hours,

most conducive to a full development of its peculiar power.

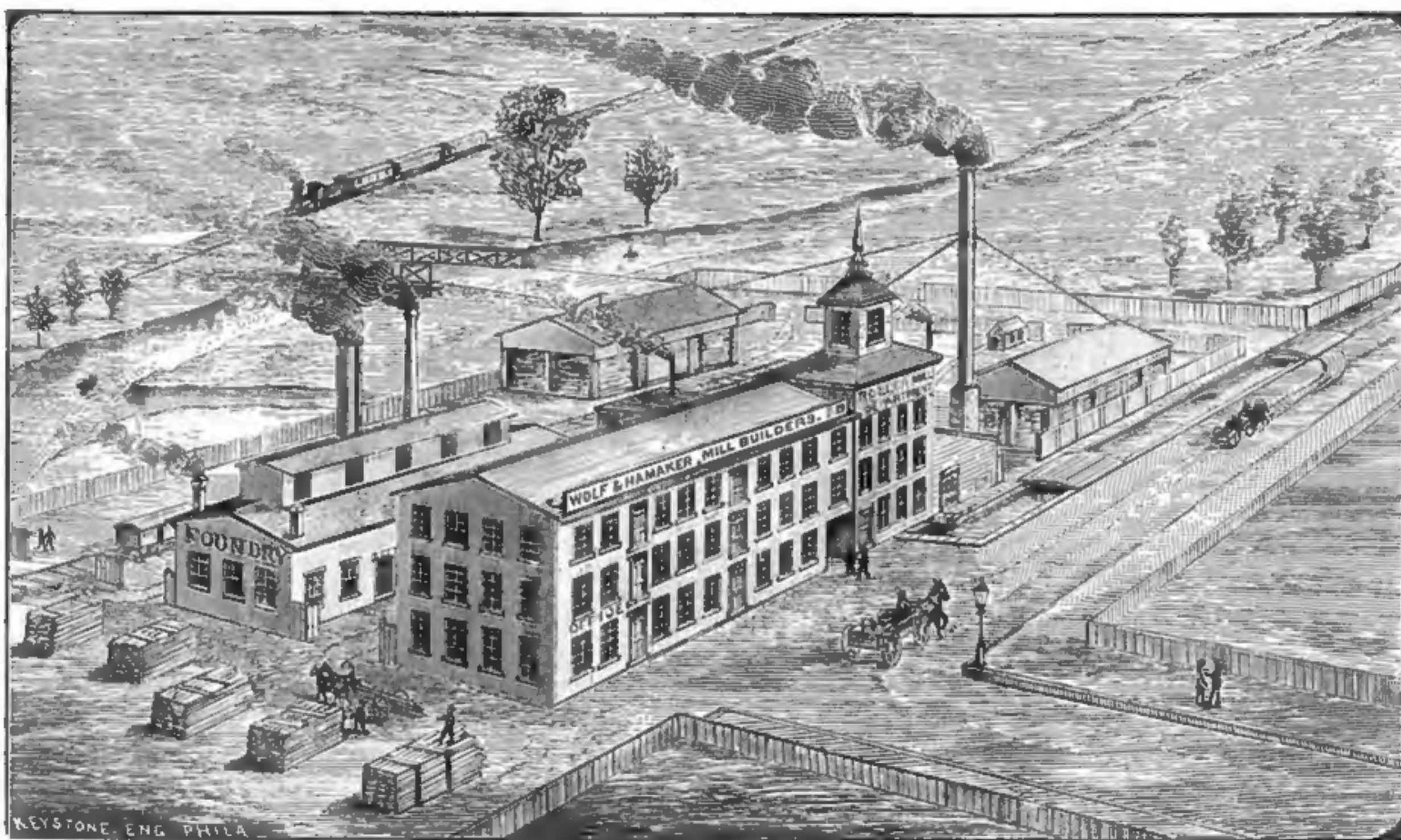
Experiments made to determine the location of the ferment, lead to the supposition that it is contained in the membrane which surrounds the germ, but not in the germ itself. Germinating wheat was washed in a small quantity of water, of which a portion was then filtered. A dough made with the unfiltered wash water gave hardly any gluten, while another sample from the same flour, prepared with the filtered water, gave, after a rest of 20 hours, 24 per cent. of gluten.

The same wheat in a sound condition was treated in a similar manner, but the resulting wash water was entirely neutral. The action of the ferment remained unaltered when, instead of pure water, a five per cent. solution of borax was used. Ten centigrammes of germs from hard Indian wheat, were washed with a quantity of water sufficiently large to make a dough from 20 g. hard wheat flour of first quality. After a rest of 20 hours, 6.8 g. gluten, 34 per cent. were obtained. A corresponding quantity of the same flour mixed with pure water, gave a result identically the same. Tests made with ten centi-

gresses favorably with the formation of an endless number of mycelium threads holding an immense quantity of spores. Such a manure spread on the land allows the rust spores to come into free contact with the germinating seed on the field, and the mycelium threads penetrate into the growing embryo, growing and multiplying rapidly. In such a manner the manure is an important factor in the rapid spreading of the rust diseases. Not only the fresh manure itself, when derived from animals which have eaten the rust spores with their food, but also the straw from rusty grains when used in the stables and mixed with the manure, help to spread the rust in the most effective, though natural manner.

Rust diseases can be reduced to a minimum, according to Prof. Brefeld, if the manure is allowed to become old before using it, as in that case the spores of the rust perish. There is no danger from old manure, and if only such is used on the fields, the rust diseases will lose one of their most efficient means for extensive distribution. The question of rust on grains is, after all, but little solved. Perhaps the most thoroughly investigated is the ergot. This is known not to reproduce its own kind, i. e. the ergot spores do not again produce ergot on rye, but need some intermediate host for their full development. As early as 1816 the fact was well known that the growth of the barberry bush in the vicinity of rye fields was generally in proportion to the prevalence of the ergot, and supposition pointed to the fact, that the fungus which grew on the barberry, produced the ergot in the rye. A commission appointed at that date to investigate the matter reported the foregoing conclusion with the request that the planting of the barberry bushes be prohibited within 500 feet from any rye field. Thus the question remained for a long time; the fact appeared satisfactory that the absence of barberry bushes had a beneficial influence upon the rye, which was found to contain less ergot as soon as the bushes were removed. How and in what connection these two plants influenced each other was explained by the simple assertion that the spores of the barberry fungus produced the ergot. This was sufficient at the time—experience had demonstrated in abundance that the presence of one always influenced the other, and the reason "why" was ignored. Civilization had not yet sufficiently advanced, botanical experiments and investigations were almost unknown, and the inquiring spirit of the present age did not exist, or was at best, exceedingly rare.

Not until 1865 was the true explanation of the connection between ergot and barberry published in Berlin. Then it was demonstrated that the spores of the rust, unable to produce rust again directly, go through a needed transformation on the barberry, and from here produce the rust again. The winter spores of the fungus needed the barberry for their early stages of development; in absence of the bush they would perish and were unable to produce their kind during the coming year. Here



MESSRS. WOLF & HAMAKER'S NEW WORKS, CHAMBERSBURG, PA.

the same quantity of gluten was obtained, but it was of a granular consistency and emitted the odor of freshly baked bread when treated with bran water.

Dumas has demonstrated that borate of sodium destroys the activity of the soluble ferments, but has no action upon organic ferments. 100 g. bran were mixed with a five per cent borax solution. One half of the resulting fluid was filtered and used to prepare a dough, from which, after a rest of twenty hours, 22 per cent. of gluten was obtained. The unfiltered fluid, manipulated for the same purpose, produced only five per cent. of gluten. A dough made from the same flour and a plain watery five per cent. borax solution gave 25 per cent. of gluten after a rest of 20 hours.

In all these experiments the gluten was washed for a long time in an abundance of water. From all these facts we learn that the bran contains a peculiar kind of ferment which acts upon the gluten and liquifies it. This ferment is insoluble and is not affected by a dry temperature of 212° F. Boiling water destroys its activity, a lower temperature retards its actions and about 77° F. is

grammes of germinating embryos, gave under the same conditions only 4.8 g. gluten, 24 per cent. of a soft consistency. All doughs made with a borax solution had a peculiar agreeable odor and a light yellow color. This color was in direct proportion to the purity of the flour, and appears to be due to the influence of the borax upon the germs, because the embryos give to the borax solution a fine yellow color.

RUST AND RUST DISEASES.

Prof. Brefeld recently lectured on the above subject before the Agricultural Society at Berlin, giving the following practical hints: The spores of the different varieties of rust and smut, which produce the well-known diseases of our food plants, are swallowed by animals with their food. In the animal body they are then placed into conditions most favorable for their development and find in a natural manner their way into the manure, the very stratum which offers them every facility for growth. If the manure keeps moist, as it usually does, the germination of the spores pro-

was the explanation for the simultaneous occurrence of barberry and rust and why the absence of the former had a direct bearing upon the prevalence of the latter.

The fact that rust occurred in rye even when no barberry bushes grew in the vicinity of the field, did not decrease the value of these demonstrations, and the supposition gained ground that there were other hosts for the rust spores, or some other places where they could find a favorable place for development. This has recently been discovered in Northern Germany in the *Mahonia* (*ilicifolia*). Here again practical experience had pointed in that direction years ago. During the past 25 years it had been suspected by rye growers that the abundance of the *Mahonia* had some connection with the abundance of the rust; but the supposition was that the pollen grains of the *Mahonia* caused the disease of the rye. Last year, however, it has been conclusively demonstrated that the *Mahonia* holds the same relation to the rust as the barberry, and that therefore the removal of the one from the vicinity of rye fields is as necessary as the removal of the other. Perhaps additional observations will lead to the discovery of some more plants on which the rust spores can find a suitable field for their development. If the scourge can be exterminated in this manner, the benefit accruing to the interest of the rye growing country will be large, but the study of these lower forms of vegetable parasites is surrounded with a large amount of difficulties, and the number of investigators in this particular branch of science is small.

FIRE PROTECTION IN MILLS.

In order to appreciate the value of our own fire extinguishing appliances, it is well to keep posted on those adopted or recommended in foreign countries, and the discussion held on this subject at the meeting of the National Association of British and Irish millers on Nov. 24, as reported by the *Millers' Gazette*, furnishes the desired information on the state of things in Great Britain; at least, enough to allow a comprehensive view of the situation. The President of the *Millers' Association* had made arrangements with Mr. Jas. C. Merryweather, a well known fire engineer, to confer with the council as to the best means of preventing and arresting fires in flour mills. Although the opinions expressed do not contain anything novel, his statements are worthy of notice and consideration, and command the attention of all interested in the prevention of the immense destruction of property by fires.

Mr. Merryweather advised the millers of the land as a body to combine and put every pressure on water companies and municipal authorities for maintenance of a sufficient and easy supply of water. If, for instance, a town were not furnished with sufficient hydrants, let the millers of that town spare no efforts to induce the authorities to remedy the omission. They might take it as a fact that where fire engines were scarce, there insurance rates would be high, and the converse was equally true. It was so in the United States, and the same attitude was being assumed by the insurance companies of England. Referring to particular appliances for dealing with fire, he spoke well of extinguishers, but doubted the efficacy of hand grenades; the automatic sprinkler was only efficient if the water were kept at high pressure on each floor, fitted with tubing and sprinklers. In answer to the question whether the metal capsules of the sprinklers were to be depended on to fuse, he replied that they were certainly to be relied on to work, but that the system was costly, and presented no advantages that were not found in a well arranged system of hand pumps. He would in every case recommend a good hand pump and

three buckets of water to each floor; and this he thought a sufficient supply. For fire extinguishing he would give water the preference over steam; water knocked a fire out, while steam might be said to stifle it.

Without underestimating the value of steam, he considered water at high pressure preferable under every condition, and in order to obtain the necessary pressure, he recommended the construction of water tanks in all mills as high as possible, and if placed on the top floor, mechanical means should be employed to keep the water under increased pressure, and make it applicable even on the floor on which the tank is situated. The greatest care should be exercised in the construction of the elevators, as they were without doubt, one of the most prolific agencies in the spreading of fires, not only in mills, but everywhere. Mr. Merryweather recommended the construction of dividing walls as high as possible to secure their greatest efficiency. With regard to fire-proof flooring he considered two layers of stout wood, with a layer of concrete between them, as good as any other form, and referred to the extraordinary power of resistance shown by some woods to the action of fire, instancing an oak beam now in his possession, which bore the date 1172, and came from Canterbury Cathedral, where it resisted a fierce flame to which it was subjected for a considerable time, taking only the slightest scorch. No doubt the seasoning effect of age had something to do with this iron texture. He regarded asbestos paint as a great protection against fire when thoroughly worked into the material it covered, but otherwise he attached no more value to this paint than to a coating of whitewash.

THE FREEZING OF PLANTS AND ANIMALS.

From the German by Prof. Mohr.

It is a fact as yet unaccounted for, that, whereas the thawing point of ice is constant, the freezing point of water may, under certain conditions, be brought considerably below the temperature at which ice begins to melt. Pure water has been reduced to a temperature of 5 to 9 degrees below zero Fahr., without freezing. A slight concession will then cause congelation at once, and the temperature ascends to the thawing point. The melting of the ice as well as the freezing of water, is a purely chemical process, though commonly called physical. Heat is converted into chemical effect on one side, and on the other side chemical effect is converted into heat.

The internal parts of the butterfly pupæ, which pass the winter in the open air, remain fluid in the coldest climate. If we cut such pupæ in two at a temperature of about 50 deg. Fahr., the two halves quickly congeal and become as hard as stone. Juices of plants which do not freeze during the winter, remain fluid as is shown by the flexibility of the cabbage leaf; while wet frozen linen may be broken, but refuses to bend. If you crush the leaves of green cabbage at a temperature below the freezing point, they freeze at once, and if you cut in pieces the ribs of a cabbage leaf, you cannot press water out of the ends, for it freezes the moment they are cut up. Here the question arises how is it that watery fluids remain liquid in the tissues of animals and plants, whereas they at once freeze when the tissues are injured. A constant supply of heat is not to be thought of in this connection.

Experiments have demonstrated that minute particles of sulphur can be cooled down to 170 degrees below their melting point without solidifying, but not so with larger particles. In a similar manner phosphorus can be cooled 77 degrees below its melting point before it solidifies. If we try to make an application of this to the

above mentioned phenomena of organic nature, we find that the reason why the fluids of pupæ, eggs, leaves, shoots, etc., do not freeze, is because the cells containing the fluid are very minute; in other words, the larger the cell the more quickly will plants freeze. It is well known that the young sprouts of vines, potatoes and other plants, very readily freeze under a light frost. Now such young sprouts are exceedingly juicy, contain a great deal of water and large cells. The freezing expands the water and bursts the cells, and the break-up of the texture stops the process of the growth. We can safely draw the conclusion that all Southern plants which are unable to endure our winter have large cells, and that, at the north, only such plants can be naturalized as answer to the requirements of small cells. We have, furthermore, an explanation of the hairy coat of animals. Those which live in the North have all a thick coat, while those living in the South have a thin one. Animals coming from the South, and acclimatized in the North, acquire hair, and vice versa. At the poles the fox wears his winter coat the whole year through. In Sweden his coat remains ten months; in Germany, for six; farther South, for three months, until at last it is entirely dropped. No one will here discover an aim, but rather a necessary consequence, which produces at a lower temperature a growth of hair in a manner unknown to us. The same is true as to the development of cells. If, as a general rule, a warmer temperature necessitates larger cells, then the plants of Southern regions will perish from the frost of Northern latitudes. The leaf of the potato-vine can never endure frost; the young branches of oak and beech are quite as unable to endure the frost, and suffer from it severely during the night in spring. On the other hand the spicules of the pine, and the sword-shaped leaves of the yucca can bear the most severe cold of our winters.

As regards the temperature of those portions of plants which are killed by the spring frosts, we have no definite knowledge. It is probable that these parts become by radiation considerably colder than the bulb of any thermometer, and that they do not share in the temperature of the air, but fall to a lower temperature. In cloudy nights, when the thermometer registers 30 or 31 deg. F. nothing freezes, though the contrary takes place in clear nights. But here, too, the smallness of the cells appears to lower the freezing point of water by several degrees. Yet in bringing all these probabilities forward, we have no complete explanation of the phenomenon. Such an explanation would show why it is that small particles have a different freezing point from large ones of the same substance and this would require a very profound acquaintance with the nature of the molecular motion of heat, as well as of its chemical affinity.

THE ERIE CANAL.

Hon. Frank Hiscock, of New York, having introduced in the House of Representatives a resolution which provides for the appointment of a joint committee of five members of the House and three Senators to confer with a committee of like power appointed by the Legislature of New York, and with the governor and other state officers, in regard to the canals of this state, and ascertain if they are sufficient for requirements of inter-state commerce, or if they should be enlarged, and the probable cost of enlargement. The committee shall ascertain on what terms and conditions the United States can acquire title to the canals of New York, or any of them.

Gov. Seymour, being asked for his views on the matter, said: I don't like the constant agitation of questions about our canals. I read the resolution of Mr. Hiscock with re-

gret. I do not question his motives, and I do not doubt his friendship for the interests of the state of New York. There is a great deal of history about the public works of New York which is not generally understood at this time. When the Erie canal was built, as my father was one of the commissioners, I heard very much about its history and things relating to its construction, although I was very young. Then, as now, there was opposition in the northern and southern tier of counties of New York to its construction. The people living in these sections feared it would be an unsuccessful enterprise. New York applied to other states that were interested in building up the prosperity of the country, and to Congress, to aid in building the canal. They all refused to give us any assistance. But the state went on and built the canal, which excited at that time great interest, not only in our own country, but European governments sent over agents to examine the work and report upon its value. Its success exceeded the expectations of its warmest friends.

Later in life I was a member of the Legislature of New York, and at one time chairman of the Canal Committee. At this time the subject of the public works was very earnestly discussed, not only in the Legislature but in the public press. The State officers, who were very able men, were most of them opposed to the enlargement. Mr. Flagg, who was very prominent at that time in affairs of our State, believed that the tonnage of the canal would fall off, because lumber was one of the largest articles carried, and we were rapidly cutting off the pine and other trees that furnished lumber. I combated these views to the best of my ability. The result is that at this day the lumber carried upon our canals is about four times as much as it was when it was predicted that the quantity would soon fall off.

I have no hostility to railroads. On the contrary, I was a director in one of the roads which now make up the Central. Many of the links which compose this road were not allowed by their charter to carry any freight unless they paid to the State the same tolls that would have been charged if the freight had been carried upon the canal. I exerted myself to have that law repealed, for I believe it was a restraint upon commerce that was hurtful. In the course of my official life I have been able to render services to the railroads which I did with great pleasure, because they added to their usefulness. The reason why this subject has not been generally understood, is that railroads and canals have been looked upon merely as competing modes of transportation. It is true that they do compete in many respects, but in other ways they contribute to the business of each other. Of the one hundred principal towns in the United States, nearly all are on both railway and water routes. Some of them have been made prosperous by water powers or other causes, but the rule is that they owe their prosperity to water routes. Regarding railroads and canals merely as competing routes, many have concluded that the days of the usefulness of the canal have passed away, while in fact the Erie canal has never been of such advantage to our State and country as during the past eight or ten years. New York was at no time as much benefitted by the Erie canal when it was the only route of commerce as it is at this day.

Up to 1870 the toll upon a hundred weight of grain from Buffalo to New York was ten cents. Under this rate of toll boatmen could not carry grain from Buffalo to New York except at a charge of from twelve to sixteen cents. The rates of toll were gradually cut down to a nominal sum, and then the canals were made free. The statements of our commerce made to the General Gov-

ernment by Mr. Nimmo teach us truths that should be understood by every citizen. From 1866 to 1875 the balance of trade against this country was \$800,000,000. The result was great embarrassment and disastrous failures. In 1876 the reduction of canal tolls and the consequent reduction of railroad freights turned the balance of trade in our favor, so that in eight years, from 1876 to 1883, the balance of trade was in our favor more than \$1,300,000,000. This change was brought about by cutting down the cost of canal transportation, and the reductions were followed by the railroads, with the following results: The cost of carrying a bushel of grain from Chicago by lake and canal in 1868 was more than twenty-five cents; by all rail it was more than forty-two cents. In 1882 the cost of carrying a bushel of grain the same distance by lake and canal was between eight and nine cents. By all rail it was about fourteen cents. These reductions enabled us to export our grain and provisions and gave to the whole country wonderful prosperity. New York's share of this favorable balance of trade, in proportion to its population, was \$15,000,000 a year. But that does not tell the whole benefit to the State, for the gain was mainly made by the Northern States, and the City and State of New York were benefitted by their prosperity. Yet to keep the canal in repair has cost only about \$1,000,000 a year. It pays this State to keep up the canal, irrespective of the amount of business done upon it. It is of immense value, greater than ever heretofore, by regulating and ordering the cost of carrying throughout the country.

I do not think anything would be gained by enlarging the canal, or that it would cheapen carrying. It might be well to lengthen the locks, but the canal boats now in use make the cheapest vessels for carrying that can be built. They are simply long, square boats with a shadow of a bow and a stern. Their bottoms as a rule are as wide as their decks. As the waters of the canal are always smooth, they can be built very light compared with lake or sea craft. When loaded, almost the entire weight is made up of cargo. There are two great difficulties in the way of a further enlargement. In the first place no supply of water can be obtained unless a large portion of it is raised so that the water would flow in from Lake Erie. This would not only cost a vast sum, but it would be attended with great danger and obstructions. As a rule the present canal is above the surface of the country. On its northern side the land a little distance from it and parallel with it is generally lower than the bottom of the canal. A large share of Utica is lower than the bottom of the canal. In order to drain the towns and villages and the country through which the canal passes, it is necessary to make a great number of aqueducts, culverts, and street drains. A large volume of water would increase the pressure upon these. We now have frequent breaks; hardly a year passes without one or more. If the canal is enlarged these would be more frequent and more disastrous. I believe Mr. Hiscock is a friend of the public improvements, and I think when he looks into this question he will find that the plan for a ship canal or a still more enlarged canal is a mistake.

There is another difficulty; The constant agitation of questions about the canals, instead of letting them alone, does great mischief. It makes an uncertainty in regard to them, which hinders people from engaging in business on them and stops the building of boats. The railroads are at the bottom of much of the agitation because they want to get rid of the canals. I do not believe that is Mr. Hiscock's idea, however.

I have great respect for the managers of the railroads; but the past shows that they have always charged more than the canals. This is a question that concerns the State

through a long period of years. We must not, therefore, base our policy upon our respect for the present management of the canals. In a few years the present officers will be changed. If the state of New York shall give up the canals, which it must give alone to the General Government, the canal would be controlled by those who are rivals of New York's commercial interests.

New England, that seeks to turn commerce to Boston, has twelve Senators for 4,000,000 people, while New York, with a population of 5,000,000, has but two Senators. The railroads of Maryland and Pennsylvania are trying to turn commerce to Philadelphia and Baltimore. Those living on the Mississippi River seek to make that stream the great channel of commerce. How are we to protect ourselves against all these interests? How are we to protect our city and State against the policy of the General Government, if New York gives up the control of the Erie Canal?

If the canal should be abandoned at any time we should feel another great evil. I understand that on lines of railroad where there are no competing water routes the people near the eastern end are compelled to pay higher rates for carrying than is charged at the West where these lines come into competition. I had a letter from a man living in Pennsylvania who wrote that he owned land near the Eastern portion of that State, and also owned land in the West, and that he was charged more for carrying through his own State than he paid for freight from the West to the same point. I think this rule is true upon all the roads where there are no competing water routes.

Although there is a general belief that railroads will supersede canals, the report of this year's business shows that there has been an increase of canal business, while upon railroads, there has been a decrease. The canals carried last year a largely increased quantity of wheat and lumber. I have not at hand a copy of the report of the superintendent, so I am unable to give the details of the increase.

The things carried by canal do more to create wealth in a community than the things carried upon a railroad. Coarse products, as a rule, give more employment and make more business than finished articles. A boat load of lumber, stone, or dry goods goes into the hands of mechanics and the material is increased in value from 500 to 1,000 per cent., while the largest share of railroad freights is made up of completed articles and we get but a small percentage upon their value for carrying them through the State. It is true that there is competition upon grain and many other articles. Nevertheless the great truth is that canals and railroads contribute business to each other. Building materials for houses, stores, and factories are best carried by water. Where these are completed they make business for the railroads. The prosperity of the State and country demands that we have both systems of transportation. If the canal is ever abandoned it will be a cause of regret hereafter, and none will feel it more deeply than those who may bring about this sad result. I confess I have a deep feeling on this subject, growing out of my knowledge of the history of the work, of its benefits in the past, and of its value now as a regulator and check upon undue charges.

THE YEAR 1884 AND THE RAILWAYS.

The year 1884, now closing, has not been an auspicious one for the railways. The continued and increased industrial depression, the steady downward tendency of rates—owing in part to competition and in part to hostile legislation—the very unprofitable wars of roads which have characterized the last few months, and the singular fact that while the West is teeming with an overabun-

dance of crops, prices are so low that farmers are holding back their production from market—all these things have combined to reduce earnings and to harass railway managers, railway owners and railway employees with present trouble and with apprehension for the future.

During the year foreclosure sales of roads for some time bankrupt have been going on, although not to any alarming extent. Our records show that fifteen roads, with a mileage of only 680 miles, have been sold under foreclosure. In the previous year the number of sales was eighteen, with a mileage of 1,350 miles, and this was less than for several previous years, so that the comparison for 1884 in this respect is not unfavorable. But the number of companies which, during the present year, have gone into the hands of receivers indicates that a new era of foreclosures has begun, although it is not likely to be of long duration. We find that in 1884 receivers were appointed for forty-three different companies, several of them of much importance, including the New York, West Shore and Buffalo, Wabash, St. Louis and Pacific, Philadelphia and Reading, Denver and Rio Grande, Allegheny Valley, Ohio Central, Texas and St. Louis, Denver and Rio Grande, Western, Portland and Ogdensburg, Memphis and Little Rock, Wheeling and Lake Erie and some others of less note. Not a few other companies are struggling with difficulty to keep their heads above water, and unless the times and the public temper improve there is likely to be a considerable addition to the list of receiverships during the coming year.

In respect to new construction, 1884 has not made a remarkable record, although the total is greater than could, perhaps, have been expected. About 4,000 miles of new main track have been laid on 166 different lines. This shows an average of only about twenty-four miles to each road, which indicates that most of the construction has been on extensions or branches. The principal lines which have been completed during the year are as follows: The Oregon Short Line of the Union Pacific Railway Company to its terminus at Huntington, Ore.; the Oregon Railway and Navigation Company's main line to the same point, connecting with the first-named road and forming another through line to the Pacific; the Louisville, New Orleans and Texas, completing a road from Memphis to New Orleans along the Mississippi River; the Wisconsin Central's line from Chippewa Falls, Wis., to St. Paul, Minn.; the Burlington, Cedar Rapids and Northern's extension through Minnesota to Watertown, Dak.; the extension of the Minneapolis and St. Louis to the same point; the completion of the Northern Pacific's Wisconsin Division to Ashland, Wis.; the New York, Philadelphia and Norfolk, which has been finished through Maryland to a point opposite Norfolk, Va. A number of other shorter lines of local importance have been finished.

At a meeting of the stockholders of the Lake Superior Elevator Company, held in Duluth, it was definitely decided to build another elevator at Duluth, for the business of the coming year, with a capacity of 1,500,000 bushels, and it is understood that the Union Improvement and Elevator Company will also build another of 1,000,000 bushels capacity. The erection of these elevators has been rendered absolutely necessary by the proportions which the grain trade of Duluth has assumed, and by reason of the fact that the trade is increasing too rapidly. Large transactions now take place on 'Change, and many new members have recently joined the Board of Trade, so that Duluth is rapidly coming so the front as a trading wheat market. It is shown by the fact that during the past season Duluth shipped nearly, if not quite as much wheat as Chicago, and that she already has in store for winter storage 4,500,000 bushels, and will have 6,000,000 bushels in store by next spring. The capacity of the Duluth elevators, when the new houses are completed, will be 8,700,000 bushels.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1½ cents for each additional word. Cash with order. Three consecutive insertions will be given for the price of two.

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As Miller, Millwright, Engineer or Machinist. Fully competent in any of the above businesses. Have spent over 20 years. Satisfaction guaranteed. GEORGE WRIGHT, Fishkill Landing, N. Y. 9

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Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1½ cents per word for one insertion, or 4 cents per word for four insertions. No order taken for less than 50 cents for one insertion, or \$1 for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.

CHEAP! CHEAP!! CHEAP!!!

I will sell one "Yale" vertical mill, style B. 12 inch burrs, all iron frame, entirely new, never having been used, very, very cheap for cash. Address "Bargain" care THE MILLING WORLD, Buffalo, N. Y.

YOU CAN BUY THESE CHEAP.

Three McCully Corn Cob Crushers. The above articles are brand new, in perfect condition, just as they left the factories, and will be sold very cheap for cash. Address S. 30, care THE MILLING WORLD, Buffalo, N. Y. 11

FOR SALE CHEAP.

Four-run water power grist and merchant mill, with a good custom. All modern improvements to make first-class flour; machinery new; in a good grain-growing section on railroad. Would sell all or one-half. For further information inquire of GILGER & LONG, Hadley, Mercer county, Pa. 812

FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler, all complete, price, \$350; one 8-horse power engine and 10-horse power boiler, price, \$375; one 10-horse power Portable complete, price, \$350; one 10-horse power Russell Traction, price, \$500; one 4-horse power vertical engine, price, \$120. Call or address for particulars, EZRA F. LANDIS, Lancaster, Pa. 232

FISKE'S BOLTING REGULATORS

Keep the bolting cloth clean in all kinds of weather and in handling all kinds of stock. Increases the bolting capacity from 25 to 50 per cent., and prevents making specky flour. No shafting, belting or gearing required. Any one can attach it. I have a few of these devices which I will sell cheap. They are brand new. Send for description and price. Address MILL-WRIGHT, care THE MILLING WORLD, Buffalo, N. Y. 11

FOR SALE.

ONE OF THE BEST BUSINESS LOCATIONS IN THE STATE OF PENNSYLVANIA.

For the next 30 days I offer to sell my steam flouring mill, located at Sunbury, Pa., in close proximity to R. R. track, convenient to connect with short switch. The only mill in Sunbury—a town of 7,000 to 8,000 inhabitants and it being a powerful and still growing rail road centre—having 11 different outlets per rail—it is and promises to be one of the finest locations for a flouring mill in the country. Surrounded by a thickly settled agricultural community, from which wheat can be supplied all the year round to supply the demands of the manufacturing capacity of the mill. The mill is in good shape for a stone mill outfit, but can easily be without any serious expense converted into a roller mill. Having a pre-s of other business on hand I will sell low and on easy terms if applied to soon. Any further information will cheerfully be given by W. C. LYON, Sunbury, Pa. 812



HOW DOES THIS SUIT?

"Cooch's Bridge, Del., Aug. 25, '84.
"Messrs. Kreider, Campbell & Co.,
"Philadelphia, Pa.

"Gentlemen: Your machine was sent here against an —, on condition that we should keep the best, and we tried each machine, and are frank to say that if your machine cost us \$500 and the other was offered us as a present we should take yours, as we cannot find a fault with it. The above machine has a capacity of 50 bushels per hour."

We think best not to publish name, but it will be given upon application. Address, KREIDER, CAMPBELL & CO. Philadelphia, Pa.

BOLTING CLOTH.

Do not order your cloth until you have conferred with us. It will pay you, both in point of quality and price. We are prepared with special facilities for this work. Write us before you order.

CASE MANUFACTURING CO.,

Columbus, Ohio.

Office and Factory, 5th Street, north of Naughten.



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OFFICES, LEWIS BLOCK, SWAN STREET,
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G. B. DOUGLAS, - - Managing Editor.
 THOS. McFAUL, - - General Agent.

SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; can be remitted by Postal order, registered letter, or New York Exchange. If currency is enclosed in unregistered letter, it must be at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

ADVERTISING.

Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

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OUR CLUBBING LIST.

NOTE—You can save money by availing yourself of the following offers. You can please every member of your family by accepting one or more of the following offers. To save money, and at the same time make the family happy, ought to be the main object of every married man's life. See how you can do this.

Take these for Yourself.

THE MILLING WORLD, per year.....\$1.50
 WITH
 The Builder and Woodworker.....(\$1.00 per year) 2.00
 American Architect, weekly.....6.00 " " 6.50
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 American Machinist.....2.50 " " 3.00
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THE MILLING WORLD, per year.....\$1.50
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 Harper's Magazine.....(\$4.00 per year) 4.50
 Harper's Weekly.....4.00 " " 4.70
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Take these for your Children.

THE MILLING WORLD, per year.....\$1.50
 WITH
 St. Nicholas.....(\$3.00 per year) 4.00
 Harper's Young People.....2.00 " " 3.00

Readers of "The Milling World" will confer a favor upon the publishers, and derive material benefit themselves, by mentioning this paper when opening correspondence with advertisers. Drop us a postal card when you have written to an advertiser, give us his name, and then we will put you in the way of getting the benefit. Don't forget this.

THE INDUSTRIAL SITUATION.

THERE is, to our knowledge, no journal in the United States which collects and publishes more reliable information with regard to the industries of the country than "Bradstreet's." By the aid of a large number of efficient correspondents in nearly every state of the Union, it manages to obtain the most reliable data to any special question thought worthy of investigation. An eminently suitable subject at the end of a year is a review of the industrial situation of the country and Bradstreet's has instituted enquiries in 22 different states, the results

of which are published in a condensed form in its recent issue and which are worthy of the widest possible circulation among the manufacturers of the country. While it is impossible to give an abstract of the whole subject without injustice to the work done, the statistical figures given have been used in the following short resume.

The reduction of wages along the various industrial lines has amounted to from 10 to 30 per cent. all the year round. Skilled workers have experienced less of this reduction than the other departments. The number of men employed has been decreased, in some industries more, in others less. The heaviest sufferers have been the iron workers, whose forces have been reduced one-third at some points, or 20 per cent. on an average; boot and shoe makers have been reduced 14 per cent., cotton goods 12½ per cent. The reduction in wages has been largest where no industrial organizations existed; at places where trades unionism is strongest, the downward tendency of wages has been retarded to some extent.

The total number of employees engaged in the manufacturing industries in the United States in 1880 was 2,718,805. Ninety per cent. of these are included in the States, from which the present information was obtained. The total number reported as out of work in 21 States, is 316,000 or 13 per cent. of the whole number busy in 1880. A considerable number, however, will soon be at work again, as stoppages of mills and factories, at this time of the year, are customary for the sake of taking inventory. The most complete reports state that New York has dropped 16 per cent. of the men estimated as employed in 1882, Pennsylvania 14, Kentucky 17, Michigan 15, Ohio 16 and Illinois 9 per cent. In the seventeen leading industrial cities the number reported dispensed with or striking is 177,115, or nearly 56 per cent. of the total number out of employ. The average decline in the numbers employed in these cities as compared with 1880 is 19 per cent, and as against the probable number employed in 1882 as over 17 per cent., as follows:

Cities.	Number of employees in 1880.	De-crease with 1880	Per cent.
New York.....	227,322	55,580	24.
Philadelphia.....	185,527	40,000	21.
Chicago.....	79,415	10,400	13.
Boston.....	59,213	4,500	7.6
Baltimore.....	56,338	2,000	3.6
Cincinnati.....	54,517	4,500	8.1
Brooklyn.....	47,587	4,850	10.3
St. Louis.....	41,825	3,870	9.4
Pittsburgh.....	36,980	6,000	16.
Troy.....	22,424	8,200	37.
Cleveland.....	21,724	8,500	39.
Paterson.....	19,979	4,500	22.8
Buffalo.....	18,021	4,500	25.
Louisville.....	17,448	4,295	25.
Detroit.....	16,110	9,950	62.
Richmond.....	14,047	3,500	25.
Wheeling.....	5,512	2,000	36.
Totals.....	922,799	177,115	19.

Perhaps as interesting a portion of the inquiry as any is that which points to the approximate decrease in the number employed in leading lines of industry. The employees in blast furnaces, rolling mills, steel works, forges and bloomeries, foundries, machine and locomotive works in the United States in 1880 numbered 421,000 and in the states reported above 388,000. Returns indicate that at least 80,000 of such operatives have been dispensed with, or 20.6 per cent. It should be added that a share of these (those retired by reason of the stoppage of old-style or inefficient blast furnaces) are believed to have drifted into employment elsewhere. Of operatives on clothing in New York, New England, Pennsylvania and Ohio, at least 35,000 fewer are at work than a year ago, or over 27 per cent. of those in 1880. On cotton goods the decline in the number of operatives in New England, New York, New Jersey and Pennsylvania is 20,000, or nearly 12½ per cent. of the total in 1880. On woolen goods the decline in New England, New York, New Jersey and Penn-

sylvania is 24,000, or 16 per cent. of the total four years ago. In New England alone 12,000 woolen-goods operatives are idle (as against 1882), and the industry has suffered much more than that of cotton goods, in which (in New England) the total idle (as against 1882) is 13,000 hands. In boots and shoes, so far as detailed, there are 18,000 fewer operatives at work than 4 years ago (8,000 temporarily in New England), or about 14 per cent. fewer than in 1880. This industry is, however, relatively less depressed than others specified. In New York, Pennsylvania, Ohio and Kentucky there are reported 13,000 fewer employees of tobacco manufacturers, or about 17 per cent. of the total in 1880. A good share of this decline is due to shutting down of factories caused by alleged apprehension of the ratification of the Spanish treaty. In Paterson, N. J., there are 2,000 fewer silk operatives at work, or about 16 per cent. of the whole number in 1880. In Pennsylvania, Ohio and in St. Louis about 4,700 operatives in the glass factories have been laid off, or about 19 per cent. of the total employed in 1880.

It is encouraging, however, to note from the statistics, so collected, that the flouring mills throughout the country are, and have been, in a fair condition of activity, and are employing during the present year, a larger number of men than during the last year. No strikes worth mentioning are chronicled against the millers, but as the record shows no reduction in wages, the principal cause for strikes seems to have been absent. So judging from all appearances as far as the statistics can be ascertained, flour milling in the United States is, if not the most flourishing, at least one of the most flourishing industries as compared with other lines of business throughout the land. If the margins are small at present, there is some consolation in the knowledge that the dividends are equally small or smaller in other branches of industry, and millers ought to be able to end the year with satisfaction for the past, and fair prospects for the coming season.

PROBABLY most of our readers have read some portions at least of Mr. Blaine's speeches showing the marvelous growth in wealth of our beloved country, and no doubt many of us began to feel our heads swell as we thought how short a time would elapse before we as a people would control the monetary affairs of the world. Mr. Blaine's speech was of a most encouraging character, the only drawback being that it was overdrawn. Our wealth, or at least a large portion of it, was fictitious. Stocks and bonds of railroad and other corporations were quoted and rated far above their real worth, and in these much money was, and still is, invested. Bought at prices perhaps not much above their real worth, they were by manipulation forced high in nominal worth, and thus was seeming wealth forced upon their owners. We are getting down to hard pan now, and if Mr. Blaine would take the trouble to figure out the loss we have sustained by the reaction, the story he could tell would not be so encouraging as that told in the heat of the campaign. One great trouble has been that the mass of the people has counted two dollars power in purchasing, when in reality, the purchasing power is considerably less. So long as we care to, we can so arrange matters that the wage-earning class shall receive double the compensation that the same labor receives in other countries, but by so doing we do not in any manner better his condition because increase in cost of production increases selling price. It is not the amount a man earns but the amount he can purchase with his earnings that makes or mars a prosperous condition of affairs. We are very rapidly approaching the time when a dollar earned will have the power to purchase a full dol-

lar's worth of commodities, no matter in what market that dollar is expended.

THE MILLING WORLD, beginning with the current number, abandons the illustration of inventions in the line of flouring mill machinery for which letters patent may be issued. It was the first milling journal to give illustrations of such inventions, and is the last to abandon the practice. For a series of years such illustrations were of great and peculiar value to the trade, but now that invention appears to have bent its energies simply to the perfecting of details in machinery already recognized as standard, it is not deemed of sufficient interest and value to the trade to continue such illustrations. Should another revolution in milling systems and appliances be inaugurated, of which there is slight probability in the near future, we should in all likelihood resume the illustrations and description of such inventions.

THE very best time to extinguish a fire is before it starts. Many a miller would today be several thousand dollars ahead had he attended to this really self-evident fact. There are several thousands of millers today who will make money by giving heed to it. It is very poor economy to hire that watchman who will work cheapest. A dollar a night to the man to whose vigilance you entrust thousands of dollars worth of property is a pitiful sum to pay for faithful performance of duty. Don't you think so?

OUR contemporary, the Northwestern Miller, has done itself very proud indeed with its holiday number. A decided improvement over the one for last year is apparent, and all in all it is entirely worth the price asked for it, viz; 25 cents per copy. Our copy is substantially bound in flexible imitation leather, duly stamped in gold, with compliments of our contemporary, and will have honorable position among our other trophies.

TO-DAY is January 1, 1884, the date fixed for the turn of the wheel which shall start the business interests of the country on the broad highway of prosperity. When a wheel starts it moves slowly, and it may take considerable time to make the people understand that the wheel really is in motion. Then too, but perish the thought, the old engine which propels the wheel may be "stuck on de center."

AS the natural gas fever is making at present such alarming head way, it may be worth while to mention incidentally that on the northern limits of Buffalo, so-called Buffalo Plains, gas was struck two years ago, which has been utilized for the burning of hydraulic cement ever since. The gas is said to be of very good quality, and the supply has not in any way diminished so far as we know.

NOTHING can better illustrate the advantage of steam boiler inspection by organized companies than the German statistics of boiler explosions. With about 49,500 boilers in use, sixteen, on an average, explode annually; of 17,000 boilers inspected by the companies, so far only one has exploded.

WHAT a monkey and parrot time the farmers and railroads of the Northwest are having to be sure. There is something radically wrong with our laws apparently, else our horny-handed granger would be in position to compel the railroads to carry his produce to market free of charge.

THAT new leaf you have turned over today looks very nice and white doesn't it? It will be rather grimy about Christmas next, though.

ESTABLISHED 1856.

EUREKA GRAIN CLEANING MACHINERY | GENUINE DUFOUR BOLTING CLOTH

OVER 18,000 MACHINES IN USE.

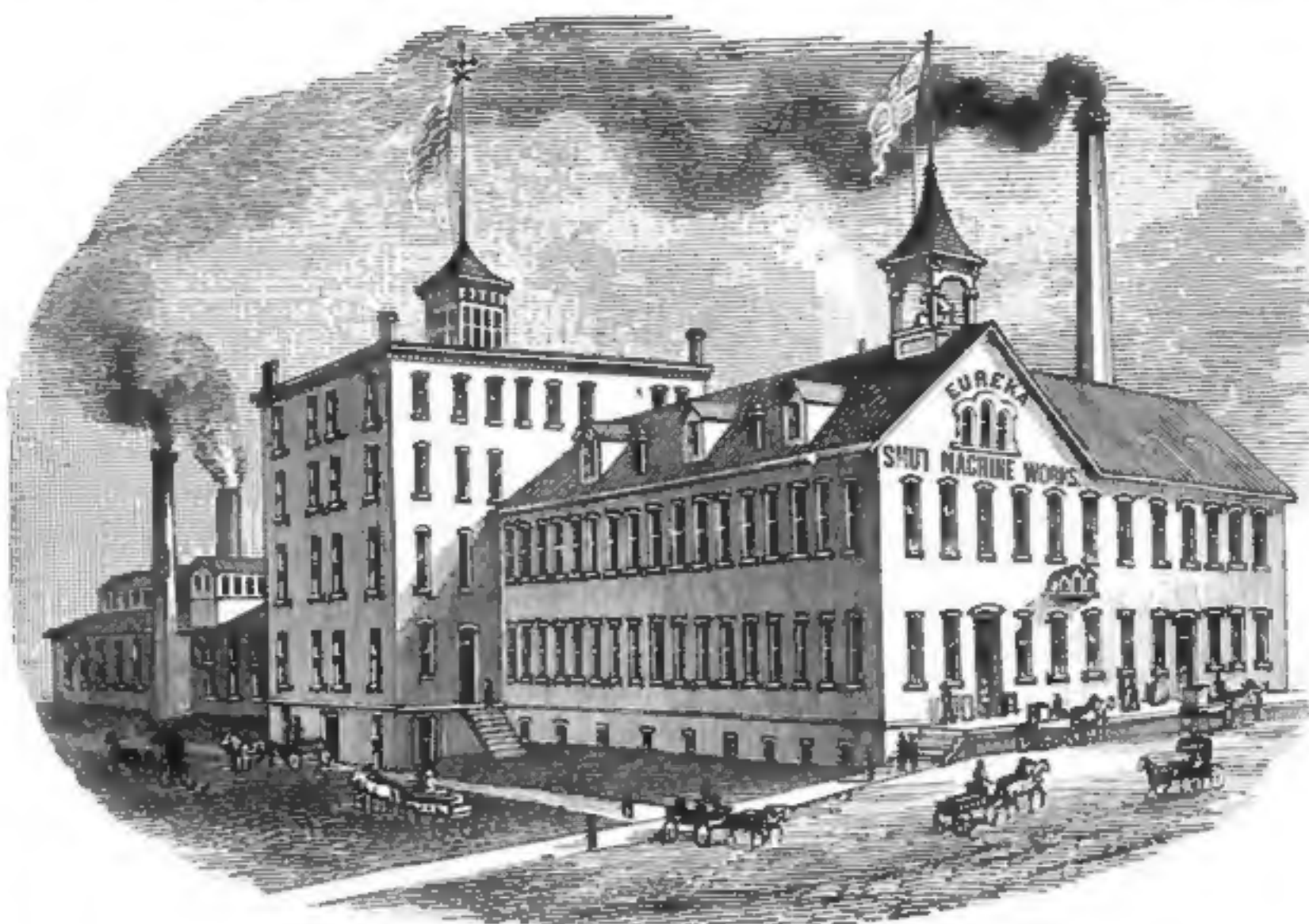
OUR LINE COMPRISES

The Eureka Separator,
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Eureka Brush Finisher,
The Eureka Magnetic Automatic Separator,
Silver Creek Flour Packer.

Our establishment is the oldest, the largest and most perfectly equipped of its class in the world, and our machinery is known and used in every country where wheat is made into flour.

HOWES & EWELL,
SILVER CREEK, N. Y.

European Warehouse and Office: 16 Mark Lane, London, E. C. England.
Gen. Agency for Australian Colonies and New Zealand.
Thos. Tyson, Melbourne, Victoria.



We handle this justly celebrated cloth in large quantities, and can fill all orders upon receipt. For such as may prefer a cheaper grade, we offer our

ANCHOR BRAND BOLTING CLOTH.

Guaranteeing it to be equal in every particular to any other cloth on the market, except the Dufour. We have handled it for years, have sold thousands of yards of it, and know it will fully sustain our representations.

Send For Samples of Cloth, Our Style of Making Up, and Prices.

HOWES & EWELL,
SILVER CREEK, N. Y.

CASE FLOUR MILL MACHINERY C. N. SMITH'S CENTRIFUGAL REEL

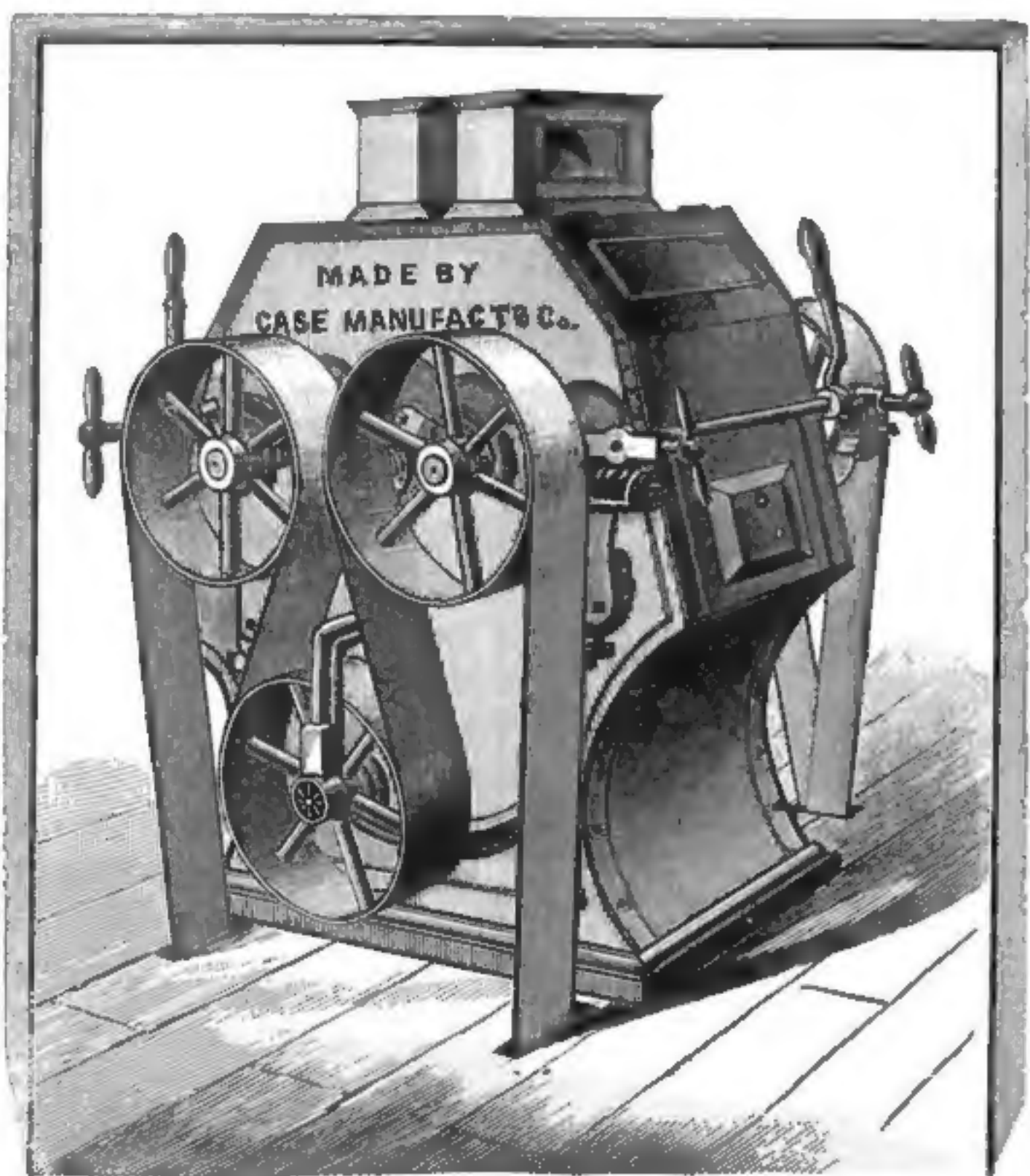
TO CASE MFG. CO., COLUMBUS, O.

CANTON, OHIO, Dec. 17, 1884.

GENTLEMEN: The mill you erected on the Full Roller System, for Mr. Harvey, of this place, is doing work which cannot be beat in America. The flour is gaining in reputation, and will continue. It is superior to other best brands sold here. When they run off from twelve, fifteen, and eighteen per cent. of low grade, when we make LESS THAN THREE PER CENT., and our feed is as clean as any mill can show.

Yours truly, R. W. DESHLER, Head Miller.

9X18 FOUR-ROLL MILL.
"BISMARCK."



9X18 FOUR-ROLL MILL.
"BISMARCK."

This is what we do for all our customers, and can do as well for you. Our system makes less "low grade" than any now in use. For low estimates address,

THE CASE MANFG. COMPANY

COLUMBUS, OHIO, U. S. A.

THE BEST AND CHEAPEST
COB CRUSHER
IN THE WORLD.

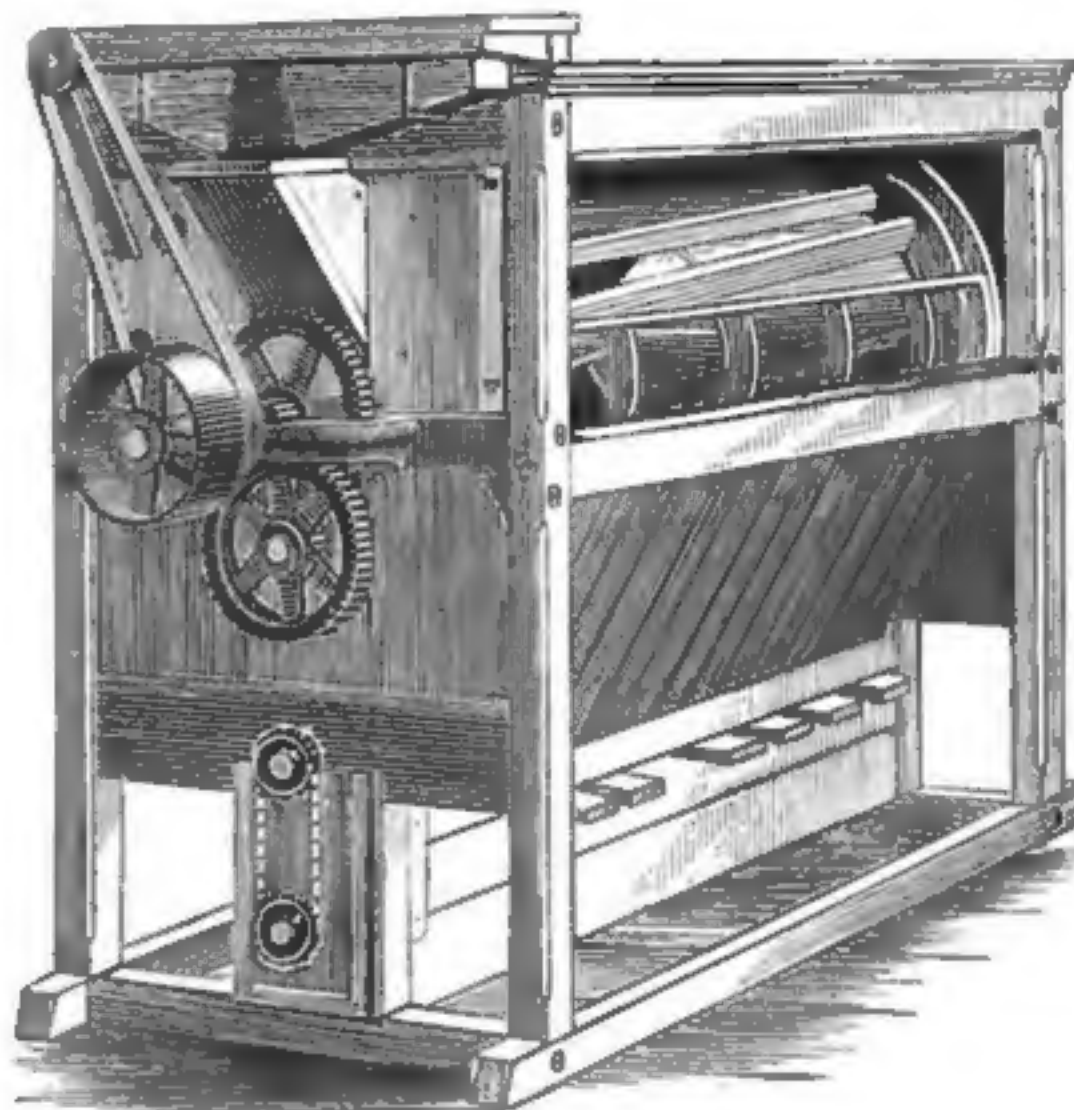
Steel Being Used in its Construction.

AGENTS WANTED EVERYWHERE.
CAPACITY 70 BUSH. PER HOUR.

Thousands of these Crushers are now in use, and giving entire satisfaction.

Please Send for Circulars.

R. C. McCULLEY, LANCASTER, PENN.



IS BEYOND QUESTION THE
BEST IN THE MARKET

AND IS SOLD FOR

THE LEAST MONEY

While the operation of every Machine is

FULLY GUARANTEED.

Send for Prices, Lists of Testimonials, and Descriptive Catalogue.

READ THIS LETTER. THEY WILL DO AS WELL FOR YOU.

OFFICE OF LUDLOW MILLS, DAYTON, OHIO, April 23, 1884.

MR. C. N. SMITH.

We have been running the two Centrifugals since February, the first without any stop whatever, and are well pleased with them. We throw less stock on our Rolls, and make four to five per cent. less Low Grade than before we had the Machine. You can refer any one to us and we will be pleased to give it a good send off. Wishing you success, we remain,

CHAS. SHUEY, Head Miller.

Yours respectfully,

CHAS. S. DURST, Supt.

MANUFACTURED ONLY BY

C. N. SMITH, DAYTON, OHIO

MANUFACTURER OF MILL FURNISHINGS.



CORN & COB CRUSHERS

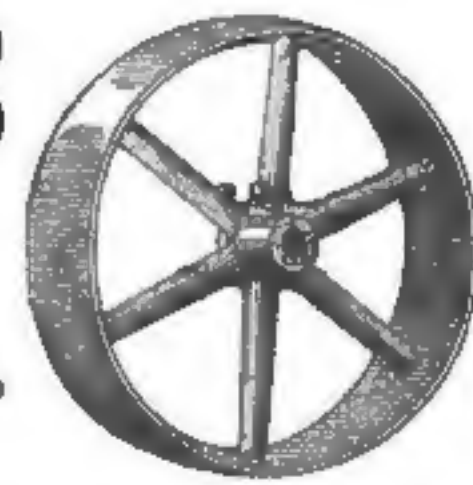
PRICE, \$15.00.

Send For Circular.

SHAFTING, PULLEYS & HANGERS.

Pulleys a Specialty, Large or Small. Address,

T. B. WOOD & SONS, CHAMBERSBURG, PA.



CALIFORNIA!

DEAL'S CALIFORNIA MAGNETIC

BRUSH SMUTTER

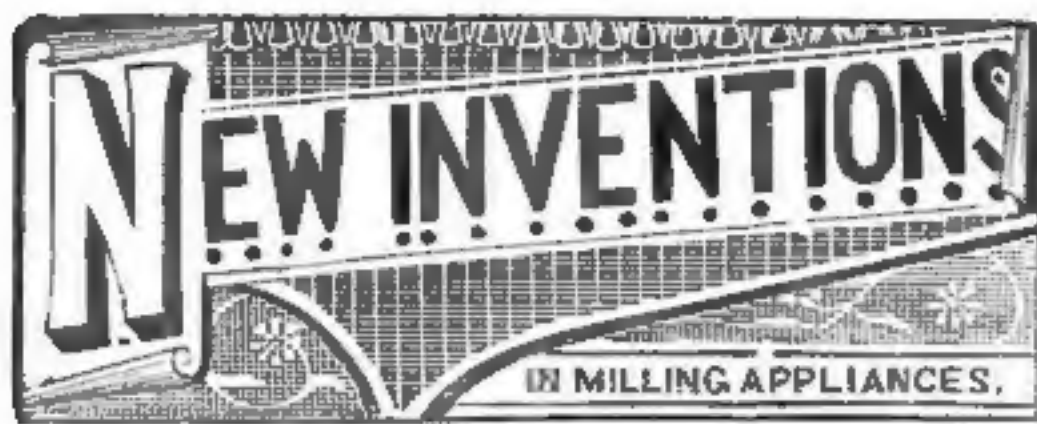
AND

SEPARATOR COMBINED

Warranted The Very Best In America.

The purchaser being the judge after 60 or 90 days' trial. We manufacture a complete line of Grain Cleaning Machinery, and guarantee every machine to give entire satisfaction or no pay. Send for circulars, it will pay you.

M. DEAL & CO.,
Sole Owners and Manufacturers,
BUCYRUS, OHIO U. S. A.



WHILE we have, for the present at least, decided to discontinue the illustration of patents granted for improvements in milling machinery and processes, we shall, from week to week, briefly notice such patents as may be granted. The first invention to which we shall refer is entitled a

GRINDING MILL.

This invention was patented to Otto Hoffman of St. Louis, Mo., is numbered 309,302 and is dated Dec. 16, 1884. It has reference to an improved grinding mill in which the runner is supported on a stationary spindle and driven by the hub of a power-transmitting pulley; and the invention consists of a grinding-mill the runner of which is supported by its balance-rynd on a center pin of an intermediate guide-cylinder that is connected by a clutch device with the hub of the driving-pulley. The top plate of the intermediate cylinder rests on the cock-head of a fixed spindle which is vertically movable in its step-frame by a worm-gear, so as to adjust the runner toward the bed-stone. The advantages claimed are, that the entire mill can be shipped mounted ready for use; that the runner is not injuriously affected by the pressure of the belt of the driving-pulley; that the horizontal position of the runner can be accurately adjusted by means of the box-wood bushes, so as to perform effectively its work in connection with the upper stone, and, that the mill runs better in oil, as all the working parts are inclosed and protected against the settling of dust.

The second invention is a

GRAIN SEPARATOR.

This invention was patented to Joseph B. Martin, of Silver Creek, New York, who assigns to Howes & Ewell, of the same place, is numbered 309,394 and is dated Dec. 16, 1884. The invention relates more particularly to an improvement in that class of grain separators in which the grain is first freed from the lighter impurities by an air-current in an air-trunk, and then sifted or subjected to a screening action, whereby the grain is separated, according to form and size, into different grades. The object being the construction of a feed mechanism which shall deliver the grain to be separated in a stream of uniform thickness, and which will permit the feed to be easily regulated, and not liable to become clogged by stones, straws, &c. Without illustrations the device would be difficult to intelligently describe.

The third invention is a

DEVICE FOR TIGHTENING BOLTING CLOTH.

This invention was patented to Charles A. Smith, of Jackson, Mich., is numbered 309,497, and is dated Dec. 16, 1884. The invention consists, essentially in extending the reel-covering beyond the head, which extension may, and usually does consist of a narrow sheet or strip of stout woven fabric of double thickness stitched at its edges to the edge of the bolting-cloth. A circular tightener, which consists, essentially, of a hoop-like wire or small rod, turned up at its ends to form ears, which are perforated to receive a tightening-bolt, carrying at its threaded end a nut, and at its opposite end a head, which prevents the bolt from passing through the ear in which it is supported. This circular tightener is seated in the fold of the fabric, and it will be readily understood that by turning the nut in the proper direction the two ears can be made to approach, and thus reduce the diameter of the circular tightener and draw the bolt-cloth

over the edge of the reel-head and toward its center. Under certain circumstances it will be found desirable to construct the reel-head with a concentric flange, against which the circular tightener shall bind the fabric, and when it is desired to mount the reel upon anti-friction rollers, as is sometimes done, it may be provided with a second flange, of somewhat less diameter than the first flange. By providing the reel-head with the two flanges, the anti-friction rollers can rotate in contact with first flange or rim without danger of their running upon the drawn-over edge of the cloth, should they become loose, the step between the two flanges keeping the rollers upon their proper way or rim.

The fourth invention is also for a

DEVICE FOR STRETCHING BOLTING CLOTH.

This invention, patented to Geo. T. Smith, Jackson, Mich., is numbered 309,498 and is dated Dec. 16, 1884. The object of this invention is to stretch the bolt-cloth longitudinally of a cylindrical or many-sided reel; and to this end the invention consists, essentially, in the combination, with a reel-cloth having its end turned over the end of the reel and extending inward on a radial line, of mechanism adapted to move the turned-over end of the cloth inwardly toward the center of the reel. This mechanism is difficult of explanation, however, without illustration.

THE CLIMATIC INFLUENCE OF VEGETATION.

The climatic influence of arboreal vegetation must be more generally understood before any legislative measures can be hoped for, says Dr. Oswald in a recent essay on that subject. In the economy of nature, forests perform innumerable functions which no artificial contrivance can imitate, and of which the following are only the most important.

Woods, in the first place, are the reservoirs of nature, and hold in the network of their roots and moss carpet, the moisture which is intended to supply our water-courses in the seasons of midsummer heat. One acre of full-grown beech trees absorbs and dispenses as much humidity as twenty acres of grape vines and tobacco and more than two hundred acres of cereals. Forests produce rain. Under the influence of vertical sun-rays, trees exhale the aqueous vapors which their roots have absorbed from the soil, and in contact with the night air or any stray current of low temperature, these vapors fall as rain or dew even in midsummer. By moistening the air woodlands also moderate the extremes of heat and cold. It is even seen on the sea shore how beneficial humidity operates in allaying the severity of winter, and in summer the evaporation of dew and rain gives us cool breezes when they are most needed. Besides this, the forest by shade in summer and fuel in winter, protects us directly against the vicissitudes of temperature, and at the foot of high mountains interposes a mechanical barrier between the valleys and avalanches in the north, and floods in the south. The water-torrents, which not only flood and damage the lowlands, but carry their fertile soil away, are imbibed or detained by extensive forests. Joseph II of Austria, was right to attach heavy penalties to the destruction of the woods on the Alpine slopes that protect the valleys from avalanches, and to propose that in wars the trees of a country should be spared by international agreement.

Our woods are also the home and shelter of these best friends of man, the insectivorous birds. A country destitute of trees is avoided by birds, and left to the ravages of locusts and other insects, which always attack the barren and naked districts. Our

locust swarms some years ago devastated the treeless expanse between the Mississippi and the Rocky Mountains, but spared the woodlands of the Alleghenies and the timber regions of the Pacific slope. The exhilarating influence of a woodland excursion is not altogether due to scenic effects and imagination. Forests exhale oxygen, the life-air of flames and animal lungs, and absorb or neutralize a variety of noxious gases. Many diseases disappear under the disinfecting influence of forest air. Dr. Brehm observed that leprosy, so common in the valley of the Nile, and on the table-lands of Tripoli, is utterly unknown in the well-timbered valley of Abyssinia, though 400 miles nearer to the equator.

The traditions of early travelers of the "blessed islands of the west" probably referred to the Maderia group, which according to DeGama's description, must have come nearer to our idea of terrestrial paradise than any other region of this earth. "The ills that flesh is heir to," he says, "are only three, wounds, the effect of poison, and decrepitude; the latter rarely makes its appearance before the completion of the ninetyeth year." Since the Portuguese have felled their glorious forests for the sake of building material, these islands have become hot-beds of disease. The valley of the Guadalquivir, as late as one century before the discovery of America, supported a population of 7,000,000 of probably the healthiest and happiest people of Southern Europe. Since the live oak and chestnut groves of the surrounding heights have disappointed, this population has shrunk to a million and a quarter of sickly wretches, who depend for their sustenance upon the scant produce of sandy barrens that become sandier and drier every year.

It would be exaggeration to say that the barrenness of a treeless country is an evil without remedy. Nature is always ready to assist in any work of regeneration, and there is no desert so void and naked that it might not be reclaimed in the course of half a century. But how slow is this work of restoration, and how easily might we forestall its necessity if we would begin in time. A legislative act to protect the woods of all the upper ridges in hill-countries, and of a certain percentage of acres, say fifteen in a hundred, in the plans, would be an effectual guarantee against evils which otherwise will assuredly overtake us, and speedier than in Europe, on account of the compact shape of our continent, that deprives us of the advantage of a marine climate. Let us remember that timely prevention not only saves us from diseases, but from these greater evils, the remedies.

HOW HARTFORD WON ITS REPUTATION AS A GREAT INSURANCE CENTER.

A little more than half a century ago—December 16, 1835—occurred the memorable great fire which swept away the business section of New York. It was to that city what the great fire was to Boston a dozen years ago, and it served, as did this latter event, to win for Hartford that reputation it has to-day as one of the greatest insurance centers of the world. There were only three companies there then, with about \$100,000 each of capital, and that not fully paid up. The news of the great conflagration in New York was received with dismay. The companies carried large risks there, and knew that they were swamped. In this crisis Eliphalet Terry, the cool-headed, daring and shrewd president of the Hartford Fire, came to the front with a plan as dangerous as it ultimately proved successful. Terry rushed to New York. He was clothed with power to do everything that appeared best in the emergency. A glance over the ground showed him that neither his company nor either of the other two small concerns then

located there could meet their losses. The New York companies had admitted already their own ruin.

Terry's game was one of strong bluff. His first step was to advertise in the papers and by posters that the three Hartford companies would pay 100 cents on the dollar. And he followed this with another surprising announcement that if any loser wanted his money immediately, instead of waiting the customary 90 days, he could have it by submitting to a slight reduction, say 6 to 10 per cent. It was a daring and a lucky stroke. The patrons of the suspended New York companies rushed to the agents of the Hartford companies for insurance, and Terry chuckled as the gold and bills flowed in. Within a week, before any of the claims were ready for settlement, he had at command cash enough to meet twice their amount. All this was before the days of State insurance commissioners or supervision of any kind. The business men then did business on honor, and were free to make a strike like this when the opportunity arose. Of the three companies which Terry's tact saved from ruin, two are in existence to-day, with immense business, whose first impetus dates back to this event of half a century ago.

PUGILISM ON A PULLMAN.

A short time ago an old-time passenger conductor out of work made application for and obtained a position on a Pullman. His engagement was brief, lasting one day only. The sleeper of which he was in charge pulled out of Chicago for St. Louis with every berth taken. Among the passengers was a Hebrew of about 40, dark-browed and aggressive, in fact quarrelsome. At once an antagonism arose between him and the conductor. Nothing satisfied the passenger. It was "Porter, send the conductor," do this, that and the other thing. At times he was offensively insolent, so much so that the other passengers evinced their displeasure by repeatedly hissing this son of Abraham. On retiring it was found that the berth to which the Israelite was allotted was an upper one. Then there was merry hades. The poor conductor was roundly abused, but he bore it all with resignation. The next trouble was that the bed was made up wrong; the head was where the foot ought to be, etc. That was finally remedied, and sleep settled down on all but the irate Israelite, who still muttered about the abominable service. In the morning the Hebrew awakened with all his hostility intensified, and abused the poor conductor, who lost all patience at the tirade of abuse that was being poured upon him causelessly, and taking off his cap, badge and uniform coat he carefully laid them upon a seat in the car, saying as he did so;

"I herewith resign my position as a Pullman palace car conductor and resume my prerogative as a citizen, and shall thrash the devil out of you."

With that he let out with his left catching the Israelite square between the eyes. This was followed up in one, two, three order, culminating in getting the man's head in chancery and punishing him unmercifully. While this was going on the other passengers remained in their seats, urging the conductor on to further acts of violence, and jeering at the Jew's piteous appeals for mercy. The P. P. C. young man released his grasp on his tormentor, letting him drop to the bottom of the car. He immediately scrambled to his knees, clasped both hands above his head, and with tears rolling down his blanched cheeks begged that his life might be spared. The passengers, who had been provided with a matinee, in which comedy and tragedy were blended, united in a petition to the Superintendent of the company, stating the facts in the case, and that the Conductor be retained in his position as he was entirely blameless, but all to

no purpose, as a stringent rule had been violated and the Conductor lost his situation. It might be said that the company re-employed him in a different and better position, but it would not be true, and as the above narrative is a fact it would not do even to prove a good ending to make a statement of that kind—besides, corporations are soulless.

FOR THE BENEFIT OF NEW ORLEANS.

The arrangements perfected by the various Pacific Railroad Companies are giving satisfaction to travelers from the Pacific Slope to the New Orleans Exposition. The rates are considered very reasonable, and from San Francisco to New Orleans visitors have the choice of four routes, namely: By San Antonio, Tex., by Shreveport, La., by Omaha and by Kansas City. The round-trip ticket from San Francisco to New Orleans, by San Antonio or Shreveport, over the Southern Pacific Railroad, is \$140. By the Central Pacific and connecting lines, the passenger is taken to Omaha or Kansas City and return for \$140, he paying extra the fare charged between these two termini and New Orleans. The railroads between New Orleans and Omaha and Kansas City have, however, made liberal rates, as has just been announced by P. S. Eustis, General Ticket Agent of the Burlington and Missouri Railroad. A first-class unlimited ticket from Omaha to New Orleans, or vice versa, is sold for \$38 75; limited, \$27 50; or from Pacific Junction, \$32 50 and \$27; or from Atchison, \$28 30 and \$24; to or from Kansas City, \$26 85 and \$22 75. The above prices are for tickets one way. On round-trip tickets between New Orleans and the above named places a rate is made whereby a ticket to run forty days will be sold "at the same rate as first-class limited one-way tickets." According to the interpretation put upon this by railroad men in San Francisco, a round-trip ticket can be obtained for the sum that would be paid for a single-trip limited ticket. This will give a very reasonable rate from San Francisco to New Orleans, and according to routes, the fare from San Francisco to New Orleans and back will be as follows: By the two routes over the Southern Pacific, \$140; by either South-

ern Pacific route to New Orleans, returning by way of Kansas City, \$162 75; returning by way of Omaha, \$167 75. Going from San Francisco to Kansas City or Omaha, thence to New Orleans, and home by the Southern Pacific, the cost would be as above. Going by Kansas City and Omaha and returning the same way, the cost will also be as above.

THE LIME-KILN CLUB.

"Almos' every day," said Brother Gardner as Judge Cadaver fell over the stove hearth and opened the meeting, "I find in de newspapers an article entitled: 'De Fucher of de Cull'd Race', or 'What kin we do wid de Cull'd Man,' or 'Am de Black Man Improvin'! De aiverage white man loves to lean back in his cheer, put his thumbs into his vest holes, an' pat us on de back fur good boys, feelin' dat he am dead-perfect. an' dat we may some day secure de right to sot in his shadder.

"Gem'len, what am de fucher of de white man? What kin we do wid him? Am de white man improvin? Let us lean back an' study him a bit. Who suffers polygamy to walk frew de West wid its hat on its ear an' openly defyin' law an' decency? De white man!

"Who am responsible for de liquor traffick an' its burdens of woe an' misery? De white man!

"Who takes de money of widers an' or-funs an' his feller-men an' hies him across de frontier to safe quarters, wrecking scores of homes an' bringin' ruin to hundreds of people? De white man!

"Who, as de trusted servant of de people, robs an' plunders an' embezzles? De white man!

"Dar' may be ten white men to ebery cull'd man, but for ebery one black man convicted of arson, adultery, forgery, burglary, or murder, twenty-eight white men am hauled up an' sent ober de road. Whar' dar' am one cull'd man in prison he has fifty white men to keep him company. So much fur deir honesty.

"What am de white man's fucher? He am growin' sordid. He am becomin' selfish. He am incited by ambition which trample laws under foot an' give no heed to de voice of honesty. Dissapashun an' wine-tiplin' an' gluttony am shatterin' his nerves an'

thinnin' his blood. In two ginerashuns mo' three out of ebery ten men will be vicious cranks or silly fools.

"What kin we do with him? Nuffin'. In his vanity an' egotism he am plungin' forward to destrucshun, an' he am bound to fetch up on de rocks.

"Am de white man improvin'? Look ober de long list of statesmen, poets, artists, advocates, physicians, philanthropists and naturalists of twenty years ago an' match it if you kin wid de names of men to-day. You can't do it! De white man has passed his zenith an' am now on de down-hill side. High libin', fast libin' an' a constant excitement hev combined to befuddle his intellect, an' wreck his physical powers, an' thirty years hence a thinker will be a side-show to himself. We doan't want any patten' on de back by white folkses. We am hoein' our row right longside of him, an' let him look out dat we doan' reach de cand fust."—Free Press.

Messrs. Higginbottom & Stuart, of Liverpool, England, have designed a new driving arrangement for their disc mills, of which they now drive three on one stand.

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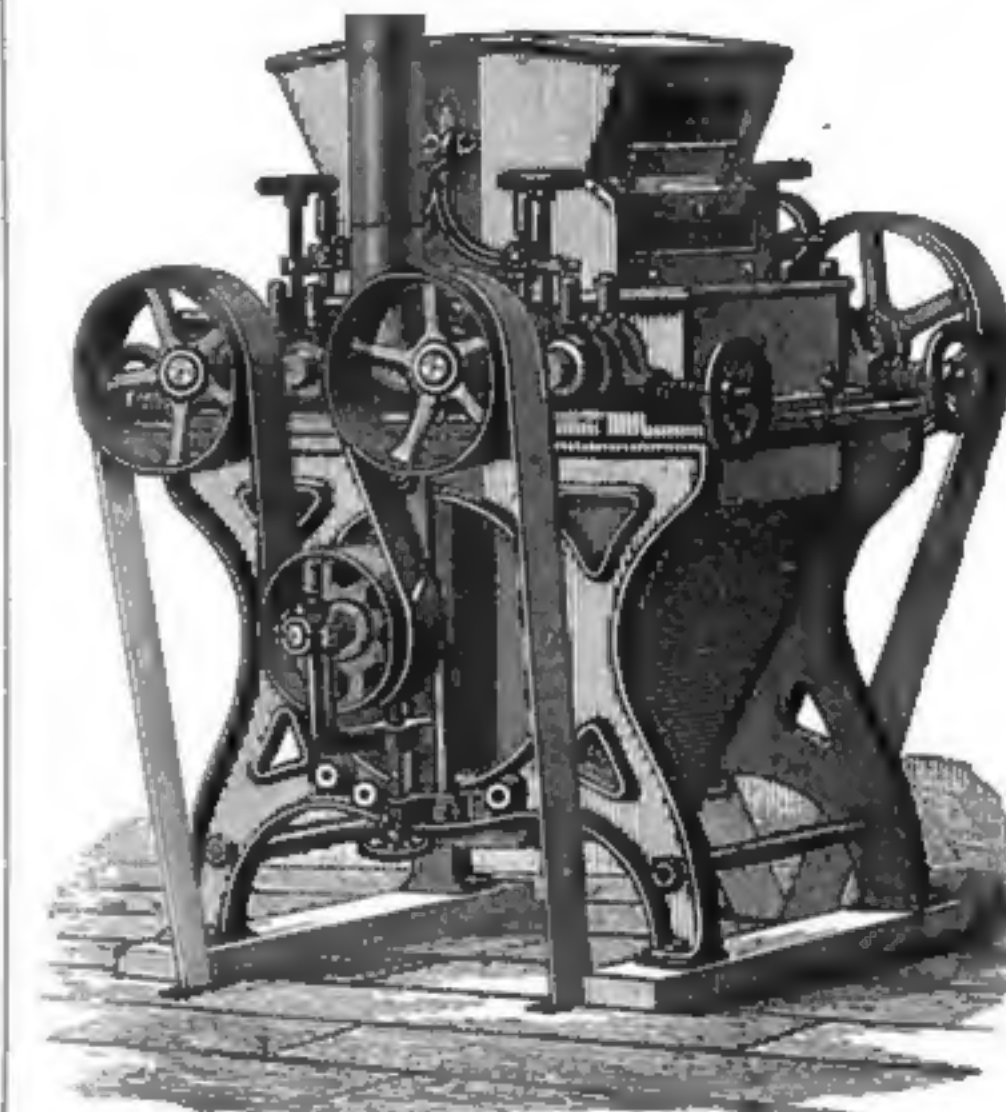


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THE FUTURE OF THE STEAM ENGINE.

THE action of the steam engine is fast approaching in practice to the limits of perfection which the science of thermodynamics prescribes, and its economy is nearing the figures of the best obtainable results theoretically. With the high speed of the present day and with superheating and with the moderate ratios of expansion which true economy dictates, the percentage of steam unaccounted for by the indicator is gradually coming down to a decidedly low figure in the best class of engines. So, too, the percentage of loss by friction is being reduced to a minimum, while back pressure of steam is a constantly decreasing quantity. The use of higher initial steam pressure is an important direction of progress to secure greater economy of the engine, but the gain from this source is of less import as the back pressure is reduced to a vanishing quantity.

In how far the economy of the steam engine is by necessity limited to a comparatively narrow scope, is plain to those who appreciate first, the influence of the second law of thermodynamics and the effect of the principle that the most economical engine for a given power is that which develops the same for the least total current cost. The existence of the second law teaches us that the limit of attainable efficiency is the difference between the temperature of the initial steam pressure and the temperature of the steam at exhaust divided by the absolute temperature of the initial steam. The existence of the theory that the most economical engine is that which develops the power for the least current cost, reduces the limit of difference advisable between the initial and final temperature of steam, and thus further narrows the limits of economy which the second law already prescribes.

Keeping this in mind, we are not inclined to regard the economy attainable in the steam engine as exceeding very greatly that now reached in the best class of modern engines. A reduction in the cost of manufacture and materials, moderate superheating, higher steam pressure, a further reduction of friction and back pressure, and preventing loss by initial condensation and re-evaporation will of course increase the economy, but for many years to come 15 to 20 per cent. increase in economy above the best practice of to-day, that is to say a reduction of an equivalent percentage in the current cost per horse power is not to be expected. Of course many types of engines now in existence can greatly improve beyond this percentage, because they could be improved at once, but the best modern engines running most economically at the present time have little outlook ahead of beating the figures named.

All this does not sound very cheerfully for the steam engine, except when we remember that notwithstanding all that has been said to the contrary, the steam engine undoubtedly possesses at the present time the recognized superiority, except, perhaps, for the very small powers. This superiority is not by any means at all times due to superior economy, but is mainly secured by the fact that with fair economy the steam engine is the most available prime mover, reliable as it is and concentrating large and readily adaptable and variable powers within an exceedingly small and manageable compass.

If, then, we do not lose sight of this important factor in the problem, the future of the steam engine seems far more hopeful than a hasty impression as to relative economy, is apt to lead the essayist to proclaim.

Except for small powers it has little to fear in competition regarded from all standpoints from the gas engine. Until the heat of the coal can be transformed into directly available electrical energy, the more extensive use of electricity and its appliances simply means a more extended use of steam engines. This direct transformation of the heat energy of coal into electrical energy, cannot be looked for from any signs of the time, though being a physical possibility, a lucky accident or investigation renders the discovery a matter of conjecture. If such direct transformation were established even with as great a loss of available energy as 60 per cent., it would signify the gradual abolition of all but electrical motors. But nothing favorable indicates that we are nearer such a happy state of existence to-day than we were fifty years ago.

It is then safe to conclude that the future of steam engine practice in the steadily increasing amount of power used is assured for many years to come, and this notwithstanding the fact that its economical limits of improvement are not brilliant, though they are by no means inappreciable. The statements to the contrary which are so frequent an outgrowth of an erroneous conception of the status of electrical energy, coupled with an absolute ignorance of the condition of steam engine practice, make it a necessity to briefly point out the true facts of the case, as we have done above.—Am. Engineer.

COAL PRODUCTION.

The economical importance of the anthracite coal fields can be better realized from an inspection of some of the statistics connected with their production, rather than from any brief description. During 1883 the estimated shipment of bituminous coal from Pennsylvania was 24,000,000 tons, and of bituminous coal in all the other States about 40,000,000 tons, while the reported shipment of Pennsylvania anthracite was 31,793,027 tons. The shipment of anthracite was 79 per cent. of the total coal shipment in all the other States, and 83 per cent. of the total shipment of the United States, including both Pennsylvania, bituminous and anthracite coal. During the same year the estimated production of fuel coal throughout the world was 385,000,000 tons, of which it was perceived, the shipment of the anthracite region was 8 per cent. In 1883 the largest producing colliery was Breaker No. 2 of the Susquehanna Coal Co., in the vicinity of Manticoke, its total production for the year being 420,543 tons. Of the total coal shipped, 49.08 per cent. was sent from the Wyoming region; 19.23 per cent. from the Lehigh region, and 31.69 per cent. from the Schuylkill region. Of the total anthracite shipment 13,148,185 tons were sent to Eastern competitive points at tide water, and the remainder sold to the home trade.

The largest mining company is the Philadelphia and Reading Coal and Iron Company; the production during 1883 was 4,582,667 tons. In addition to this the company had leased several collieries during the year which produced 1,491,465 tons, making an aggregate of 6,074,132 tons, mined at a cost of \$1.49½ per ton.

The total production of anthracite coal in Pennsylvania since 1868 is estimated at 543,200,000 tons. It is difficult to realize this quantity. Estimating that on an average a ton of coal, 2,240 lbs., in the beds, contains 25 cubic feet, this tonnage would form a solid wall 100 feet wide and 100 feet high for a distance of 257 miles. If a similar estimate be made of the coal in broken sizes, as it is shipped to market, on a basis of 40 cubic feet to the ton, it would form a wall 100 feet wide and 100 feet high for 411 miles.

During the year the estimated value of a ton of anthracite or the mines, was \$2.10,

so that the aggregate spot value of the anthracite coal produced during 1883, in Pennsylvania would be \$71,307,245. The spot value of the bituminous coals at all the mines of the United States during the same year, on the basis of \$1.20 per ton, would be \$76,800,000, while the total value of the gold and silver mined during the same year in the United States was \$71,300,000.

ANCIENT AND PRESENT GRAIN KERNELS.

It is an indisputable fact that cultivation improves the products of the earth, both quantitative and qualitative. A careful selection of the seed together with an adequate preparation of the soil will yield improved varieties, especially if the same care is exercised for a period of several years. One of the most brilliant demonstrations of the truth of this assertion in regard to our cereals has recently been published by Prof. Ferdinand Cohn, of Breslau. In connection with his researches on prehistoric plant distribution, he was fortunate enough to discover, in Upper Silesia, in an ancient burial ground, seven feet below the surface, several bushels of rye, oats, barley and peas. Of course all were in a carbonized condition, but otherwise well preserved, so that size and shape could be determined with accuracy. All of the grains were found to be considerably smaller than those seen at the present time. The weights were as follows: 10 kernels of the prehistoric rye weighed 0.88 gramme, while an equally large average sample of to-day's growth, weighs 1.22 gr. or 52 per cent more. 10 kernels of the prehistoric peas weighed 0.45 gr., those of to-day 2.9 gr., an improvement of almost 550 per cent. The original grains may have weighed a trifle more, as some of their constituent gases have escaped during the carbonizing process, but the difference cannot be considered large enough to be a factor of importance. The age of this find is not given, but whether it is a few hundred or a few thousand years old, it illustrates the immense improvements which cultivation has wrought in the size of the kernels of our cereals in the lapse of time.

* * Weevils that infest the grains have been known in Europe for a long time, but wheat unless very badly infested, is only slightly deteriorated in value on that account. At the Centennial Exhibition nearly all the grain shown from the Continental European countries was badly infested, and corn (maize), especially that from Spain, was literally filled with it. Weevil is simply a name applied to various insects which, depositing their eggs in various fruits as the plum, or grain, or pulse, eat out the inside, and when transformed into the perfect state, force their way out and procreate their species. Thus we have the plum curculio, the grain weevil, the pea weevil (*Bruchus*), well known, and the bean weevil. In fact, the name curculio is the name of the ancient Romans for that the English people call the corn weevil, the word corn there meaning cereal grains in general. Indeed, the seeds of various plants have their specific insects of the weevil tribe. In fact, the weevils, or snout beetles, are not confined to grain and stone fruits. They occur in nuts, and also in the wood of trees. The best remedy yet found for their extermination is frequent stirring of the grain. It is more than probable that fully saturating the bins with the fumes of sulphur will kill the insects, and this would not be difficult to do by means of a suitable apparatus. Although Curtis says that turpentine and the fumes of sulphur did not seem to incommode the insects, kiln drying at a heat of 180 degrees will kill them without injuring the germinating powers of the grain. Placing the infected grain in close bins, without moving, is the

best possible means of continuing their ravages, since they delight in darkness and in the grain that is not handled. In elevators the means of destruction are not so easily managed, though there is little doubt if the fumes of sulphur be driven into the bins, and there retained for ten hours, the destruction of the insects will be complete.

* * A mistake which is frequently made in setting boilers, says the "Locomotive," consists in loading them down on top with a great mass of brick work, which often does more harm than good. Of course some good non-conducting covering is necessary if we wish to attain a high degree of economy, but for boilers some of the lighter coverings are much to be preferred to brick. This is especially true in the case of long cylinder boilers, of small or comparatively small diameter. It is no unusual thing to find boilers of this type with several tons of brick and mortar piled on top, which load the boiler has to carry, in addition to its own weight, on two supports, perhaps at the extreme ends. In such cases the girth seams generally show distress near the center of the shell where the greatest strain comes. What is needed is some good light coverings, made in sections so that it can be easily removed without destroying it, for purposes of inspection and as easily replaced again.

* * Lime and sand, after being mixed, might lie two years with advantage, and for certain uses, such as boiler setting, or where the whole structure of brick and mortar is to be dried, the mortar ought to be mixed for one year before use, and two would be better; but for house building, if the bricks are so wetted as not to rob the mortar of its moisture as soon as used, mortar that has been mixed a month will form good solid silicate of lime among the bricks it is laid with in ten years, and will be still harder in a hundred years. The practice of mixing mortar in the streets and using it at once is as foolish as it is ignorant, and would be no improvement. Silicate of lime is made only by the slow action of caustic lime and sand, and on the other—under the influence of moisture. Dry they never will untie, and mixing mortar as now mixed, and using it at once, so as to dry it out and stop the formation that the mixing induced, is wrong.

* * The danger of wearing next to the skin, articles of clothing dyed with substances obtained from benzol and other products of coal tar, has been declared many times in letters from medical men both in this country and abroad, who have given instances of the ill effects caused through the absorption by the skin of these irritating and poisonous compounds. Their warnings are repeated and illustrated in a case of exhibits sent to the Health Exhibition in London, by an authority on skin diseases. In this case are specimens of some of the beautiful aniline colors, rosoline, magneta, violet red, Bismark violet, etc., and gloves and stockings dyed with the substances by which these hues are obtained that, in cases coming under the treatment of the exhibitor, had produced eruption on the skin of women and children, in some instances of a very severe character.

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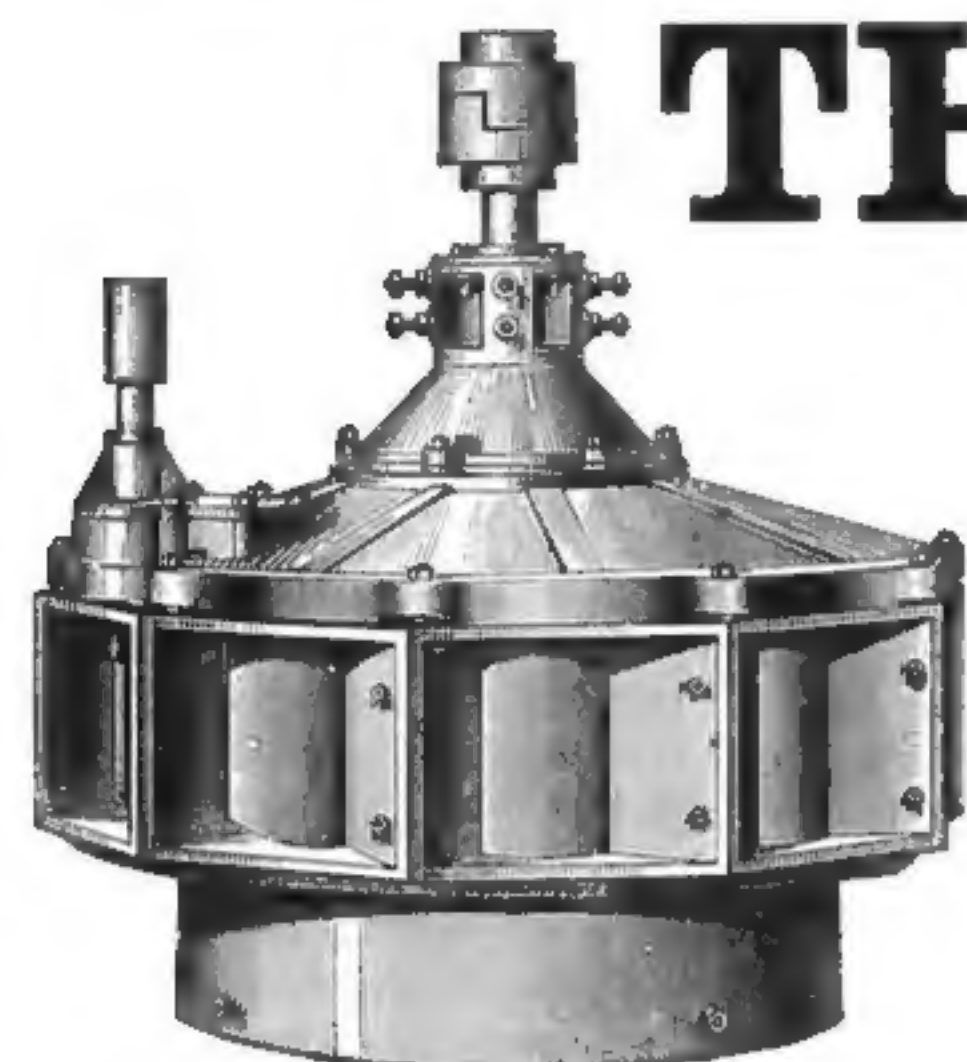
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Notes from the Mills.

It is reported that the Canadian Pacific Railway Company has definitely decided to make Coal Harbor, at Burrard Inlet, the western terminus of the railway, in place of Port Moody.

At Ladonia, Mo., Dec. 17, the large elevator known as the Hiseys, burned. The elevator belonged to Pearson, Welder & Fowler, and was worth \$5,000; insured for about \$2,000. Hisey & James had about 10,000 bushels of corn in the elevator, which was insured for \$600.

On Dec. 20, the gin-house and grist-mill of Barton Burt, in Russel county, Ala., was burned, with a large lot of cotton belonging to tenants and customers of the gin. A negro workman went into the gin-house with a candle to push the cotton back that had piled up. Immediately the whole house was in a blaze. The loss is \$10,000.

The small grist mill at Cochran, Pa., of a few years ago has grown to be a mill of large dimensions, under the management of Messrs. Smith Brothers. Recently some great improvements have been made. A new roller process has been introduced, and the four large floors of the mill are provided with the best appliances of a good flouring mill.

The upper elevator at Plainview, Minn., owned by H. J. O'Neill, has been thoroughly overhauled during the past season, the repairs and improvements costing probably over \$3,000. It is now in complete working order, and is capable of handling easily 5,000 bushels of grain per day. Mr. J. H. O'Connell has charge of the office, and John Kline is engineer.

At Victor, Iowa, Dec. 22, the large elevator of J. P. Hunt was burned to the ground. The fire was first discovered by a young man living with Mr. Hunt. It is supposed to be the work of an incendiary, and was undoubtedly, intended to burn before daylight, so that the guilty parties could burglarize the south part of the town. The loss is estimated at from \$6,000 to \$8,000; insurance, \$2,000.

Cargill Bros' water-power flouring mill at Whalan, Minn., on the Southern Minnesota division, was entirely destroyed by fire on Dec. 25. The mill had been completely remodeled to the roller system within the past year, and supplied with the very best machinery, at an expense of \$14,000, and was valued at \$30,000; insured about \$15,000. Thirty-five hundred bushels of wheat and 500 barrels of flour were destroyed.

Simultaneously with the French proposition to put a tax on imported breadstuffs comes an appeal of the Canadian millers to Sir John Macdonald for a readjustment of the duties on American wheat and flour. It would appear the duty on flour is 50 cents a barrel, while the duty on wheat is 15 cents a bushel, or 67 cents on a barrel of flour; thus discriminating against the Canadian millers to the extent of 17 cents a barrel. "Sir John," we are told, "seemed favorably impressed and promised to give the matter careful consideration."

According to Manager Smith, of the Northern Pacific Railway Company at Fargo, the acreage of spring wheat in Dakota will be reduced about 20 per cent. this year. One reason is the low prices this year, but the main cause is the fact that continuous crops in the older counties have partially exhausted the soil, and it must be given a rest. Proof of this is found in the large crop of wild buckwheat and other foul seeds last year. It is estimated that thousands of acres will lie idle this year, or be sown to other crops than wheat.

The Moroni, Utah, gradual reduction mill has been built by Jensen Bros. at a cost of \$8,000. It has a capacity of turning out 100 sacks of flour every twenty-four hours; has four floors, and is run with spring water by a 27-horse power turbine wheel. The wheat goes through several processes before grinding; passing through one separator and two smutters. The steam generator is used to prepare the wheat instead of water. After being ground the wheat passes through two pairs of rollers, two centrifugal bolts, and then on through a new middlings purifier. There are three-run of stones. Jensen Bros. claim to have the best flouring mill south of Salt Lake.

The Nordyke & Marmon Co., are in receipt of the following letter dated Dec. 16, from Chas. P. Wiggins, Manager of their exhibit at New Orleans Exposition: "The great show has opened. At high noon, with the assistance of a little

electric wire, President Arthur, sitting 1,300 miles away, started the large Corliss engine amid the booming of guns, ringing of bells, clashing bands and shouts of the people. All of the great engines started promptly, together with the Nordyke & Marmon Co. exhibit, but not another display of any kind was ready to turn a wheel. This, of course, made our platform the center of attraction, and we were complimented right and left. Mr. Arthur started the big engines, but Mrs. Wiggins started our show. She grasped the lever of the clutch pulley, and with one strong pull set every wheel and mill in motion, amid the 'deafening shouts of the excited multitude.' Everything moved off in good shape, and although not one of our competitors are near ready to run, they all came over and congratulated us upon our successful start. I cannot say at this moment how many people were on the grounds, but will learn and advise you later."

The advance in freight rates throughout Illinois, says the St. Louis *Globe-Democrat*, will ruin all trade in flour between St. Louis and Chicago. The tariff has been 20c. a barrel in car-load lots from East St. Louis, but the roads have been taking it out at 11 and 14c.—usually the latter. The rate now is 30c. a barrel. Some millers who have contracts for future delivery have made arrangements to send up all the flour they can lay their hands on, to be stored or kept in the railroad yards until needed. "I don't see how we can do any business with Chicago now," said Alex. H. Smith. "It has been a close squeeze to compete with Northern mills at a 14c. rate, and with the 'Guelphs and Ghibelines' putting up prices of wheat here, we can not do any thing at all." "Do you think the rate is likely to be maintained?" "I do not know. The last time they restored the tariff, a little over a year ago, to 25c, they kept it there for a long time. We worked a cheap rate by the way of the I. and St. L., via Terre Haute for four months, and then over O. and M., via Vincennes, but the pooled lines bulldozed the other roads, and they dropped ns. This rate may be maintained for some time."

Thos. Potts is a millwright whose home is at Crescent, Saratoga county, N. Y., he was lately employed at his trade in the Amsterdam gold mill at Boston. Completing his labors he started to walk to Wellstown. He was unacquainted with the country, but got along very well until about the middle of the afternoon when a heavy snow storm set in, it began growing dark and he lost his way. He wandered about the mountain until about ten o'clock, when he reached West River. His knowledge of the geography of the country told him he was about twelve miles out of his way, and he sought to retrace his steps with the intention of returning to Boston. In this he was no more successful than in his efforts to reach Wellstown. The snow storm continued and partially ceased about two o'clock. Potts, nearly exhausted, cold and hungry, continued his wanderings through creeks, ravines and dugways until nearly morning, when on the slope of West Hill he met a large savage looking mastiff. For the first time in his life a savage looking dog was a pleasant sight to him. He followed the dog about a mile, when he reached the home of Jacob McIntyre, District Attorney of Hamilton county. Mr. McIntyre and family took Mr. Potts in and cared for him. After being warmed and fed, and recovered in a measure from his fatigue he was conducted to the highway leading to Wellstown, about five miles distant, and reached his destination without farther mishap.

On Thursday December, 11, the Limerick Ireland Branch of the National League received a deputation from the congegated trades on the subject of the importation of American flour, when Mr. J. O'Sullivan proposed, Mr. Kenna seconded, and it was resolved: "That in consequence of the great depression in the grain and milling industry of this city, which has given such a large amount of employment to our artizans and laborers, we should spare no efforts to foster and support this important branch of local industry; and we sincerely trust that the members of the different branches of the Irish National League in the surrounding counties will give practical effect to this resolution by purchasing home-manufactured flour instead of foreign, as the former can be had as cheap, and of far more nutritious quality. By giving a preference to this branch of industry, they will help materially to promote the trade and commerce of this old historic city, which is already in a depressed condition owing to the importation of foreign flour in large quantities. We also request the members of the various branches of the Irish National League to impress on the people the great necessity that exists for taking prompt and energetic action in this matter in which the maintenance of thousands of our fellow citizens depends, and thereby give effect to one of the principle objects for which the Irish National

League was formed, namely, the development and encouragement of the labor and industrial interests of Ireland."

George S. Barnes, of Fargo, general manager of the Northern Pacific Elevator company, speaking of the per cent. of wheat remaining in the bins of the farmers of the section along the Northern Pacific, is reported to have said: "There is not over 10 per cent. of the crop unsold, after making deductions for seed and for bread. Our company has already handled 25 per cent. more grain than last year, and I know that, along the Manitoba road, it is estimated that 85 per cent. of the crop has been marketed. At present our elevators are about two-thirds full." "Will the wheat acreage next year be as large as it was the past season?" "Of the ground that was put into wheat this year about 15 or 20 per cent. will not be seeded for next season. But enough new land, or land that has been recently broken will be sown to wheat to bring the total acreage up to what it was this year. The fact is that much of our land is playing out. Farms that have been cropped for nine or ten years did not do well this season, and it is becoming apparent that our oldest farms must have a year's rest before they will produce as abundantly as formerly. Many farmers allowed parts of their farms to remain idle last season, and the good results were so noticeable that their example will be quite generally followed." "What is the condition of the farming community of Northern Dakota, financially?" "Our farmers are not in such a bad state as has been represented. People here in Minneapolis and the east have an idea that the farmers of Dakota have been greatly injured by the low price of wheat. They forget that the extraordinarily large yield made the income of the average farmer almost as large as on former years. You may expect to see a good, healthy result grow out of the present close times."

Some three months ago, says the New Richmond, O., *Independent*, the Willenbrink Bros., of this place, determined to thoroughly overhaul their flouring mill, and make such improvements as would place it in the category of the first-class mills of the country, and first in the list of Clermont county. To this end they employed the well-known millwright, contractor and builder, Mr. S. H. Stout, of Covington, Ky., to superintend the repairs. After three months work under his supervision the Stevens rolls have been added, the bolting chests all remodeled and two new ones put in, under Stout's improved plan of bolting, a centrifugal reel for redressing the flour put in, the wheat cleaners all overhauled and proved, a set of magnets put in for taking any bits of iron, tacks, nails, etc., out of the grain. The engines have also been thoroughly and completely overhauled under Mr. Stout's supervision and are now running with more speed, and with one-third less fuel than was heretofore required and doing more work. In this instance the work was completed late in the evening, and Mr. Stout gave the order for the mill to be started at once. The proprietors objected, saying that it would be better to wait until the next day, but Mr. Stout replied that if the mill would run in the day time, it would run in the dark, and it was so demonstrated, for it was started and moved off grandly without the slightest alteration or choke and did the work to the entire satisfaction of the proprietors. The machinery used in this mill was all bought of Mr. Stout. Willenbrink Bros. thought while the mill was in progress that Mr. Stout was over particular, but when they saw how complete was the working of all the machinery they were convinced that he understood his business thoroughly. The mill has now been running for some weeks and is turning out a first-class article of flour, as we can testify. Its capacity is 75 barrels in twenty-four hours. The Messrs. Willenbrink are anxious that any one who wishes to see the working of a first-class mill, perfect in all its parts should call, and they will take great pleasure in explaining its workings, or they will answer any letters written to them in regard to it.

At Dallas, Texas, December, 26, a conflagration and holocaust occurred in the destruction of the Central Grain Elevator, corner of Lamar and Wood streets, owned by Rainwater & Stearns, and the death of two, if not three, human beings, who were unable to make their escape. At 10:30 the alarm of fire was sounded, and a dense cloud of smoke issuing from the elevator building told where it was located. Both the down-town and the East Dallas fire departments turned out in good time, but a train of cars on the down-town branch of the Houston and Texas Central railway retarded their passage for some time. It appears that the department used every effort to rescue the doomed men and save the property. A large crowd gathered, and soon it was noised around that there were several men in the building. Parties broke open a door with a crowbar and let out four persons who were shut in. It was then stated that William Keller, a lad named Dean, son of

the engineer, and Joe Evans, the latter colored, all employees, were still in the burning building. The most intense excitement prevailed, which increased when it was learned that the parties could nowhere be found. About this time all doubt as to there being persons alive in the burning building was dispelled when a slouch hat, thrown by someone, came sailing out of one of the upper windows, which were sixty or seventy feet from the ground, as a mute appeal for assistance that could not be rendered in time to save them from a horrible death. The hook and ladder company was called upon, and ladders were raised to the window through which the hat was thrown, and one of the firemen mounted it and kicked the window in. The moment he did so a volume of smoke and flames burst through the opening, and had he not taken the precaution to dodge as he did so, he would have fallen a victim to the flames, which by this time were furiously lapping the top of the building. It was evident now that the unfortunate beings had perished, and a feeling of intense horror pervaded the crowd, chilling the blood in the veins of those who looked on, powerless to do anything. The firemen fought the flames hard, but it was now a foregone conclusion that the building would prove a total loss. The weather was bitter cold, and a drizzling rain was falling, and freezing as fast as it fell. They succeeded in preventing the spread of the fire, however, and taking into consideration the structure and the combustible material it contained, to say nothing of the start the fire had of them, the men rendered good service. While an attempt was being made to save the parties in the building, Mr. Dave Rainwater, one of the owners, who had left a sick bed, offered a reward of \$2,000 for each one of them. He recognized the slouch hat thrown from the window as a signal of distress as that of Joe Evans, the colored man. The heavy timbers began to crumble, and the upper floors and the walls of the bins gave way, pouring a huge pile of burning wheat through one of the large doors on the ground floor. A black object was seen protruding from the pile, and a man, at the imminent risk of his being crushed beneath the burning timbers, made his way to the object and rescued it. It was a portion of the charred remains of a man, supposed to be those of the unfortunate Keller. They were removed to the morgue at the hospital. The head was a blackened, charred mass. The lower part of the arms and legs were in a like condition. The body, from the hips nearly to the neck, was partially preserved, and had the appearance of being that of a white man. The body was baked through, and the sight was sickening in the extreme. A search was then begun for the other body or bodies, but up to a late hour to-night they had not been recovered. It was reported subsequently that the son of the engineer had turned up alive. The fire originated in the shuck-room in the eastern end of the building, and burning down the stairway leading to the floors above, cut off all means of escape for the unfortunate men on the upper floors. There were 60,000 bushels of grain in the structure, principally wheat, which is either destroyed, or so badly injured as to be worthless. The value of the building, including the grain, machinery, etc., was estimated at about \$80,000. W. C. Howard & Co. had 20,000 bushels of wheat in the building, which is included in the above. It was insured for \$12,000. The building and all was insured for \$33,500, as follows: Central Elevator Company, (building and machinery): Phoenix, of London, \$2,500; Western Assurance, \$2,500; Hamburg and Bremen, \$2,000; Commercial Union, \$3,000; Merchants, of New York, \$1,500; Williamsburg City, \$1,500; total, \$13,000. Rainwater & Stearns' stock of grain: Crescent, of New Orleans, \$2,000; Phoenix, of London, \$1,000; Queen, of England, \$1,000; London and Provincial, \$1,000; Norwich Union, \$1,000; Williamsburg City, \$1,000; Southern Insurance Company, of New Orleans, \$1,000; total, \$8,000. W. C. Howard & Co., stock of grain: Germania, of New York, \$3,000; Queen, of England, \$2,000; Commercial Union, \$1,000; British America, \$1,000; New Orleans Insurance Company, \$1,000. Commercial, of California, \$1,000; London and Providence, \$1,000; Fire Insurance Association, of London, \$1,000; Old California Insurance Company, of San Francisco, \$1,000; total, \$12,000. Office furniture, \$220. Young Keller was about 25 years old, and was much liked by those who knew him. He was a hard-working man, and had been living with Mr. Dave Rainwater, in whose employ he had been for several years past. At the time the fatal fire occurred he was at work in the upper stories shoveling wheat. He had been a member of the Lamar Rifles, the Queen City Guards, and later of the Dallas Rifles, which company will bury him with military honors. The deceased came here from Tennessee, his native state. The remains of the other two men are buried under the still burning mass, and can not yet be recovered.



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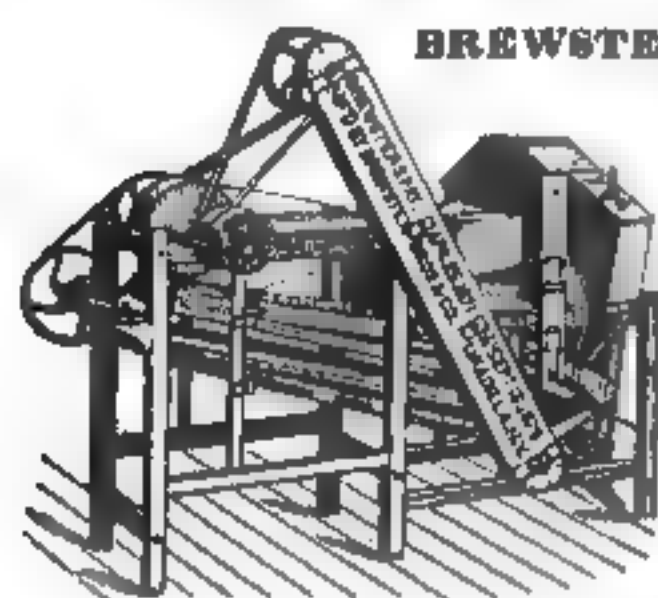
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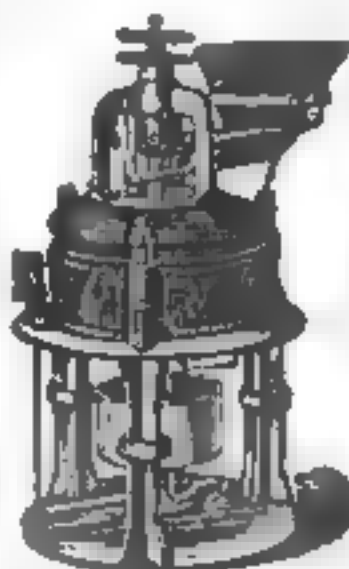
Were selected by Messrs. Pillsbury & Co, as being indisputably the best in every particular, and all bidders were required to figure on using these well-known machines. Parties from Buffalo and Indianapolis were not asked to figure on the work. The mill will be planned and erected under the supervision of the eminent milling engineer, Mr. Wm. D. Gray, and will add another to the long list of notable mills planned and built under his direction.

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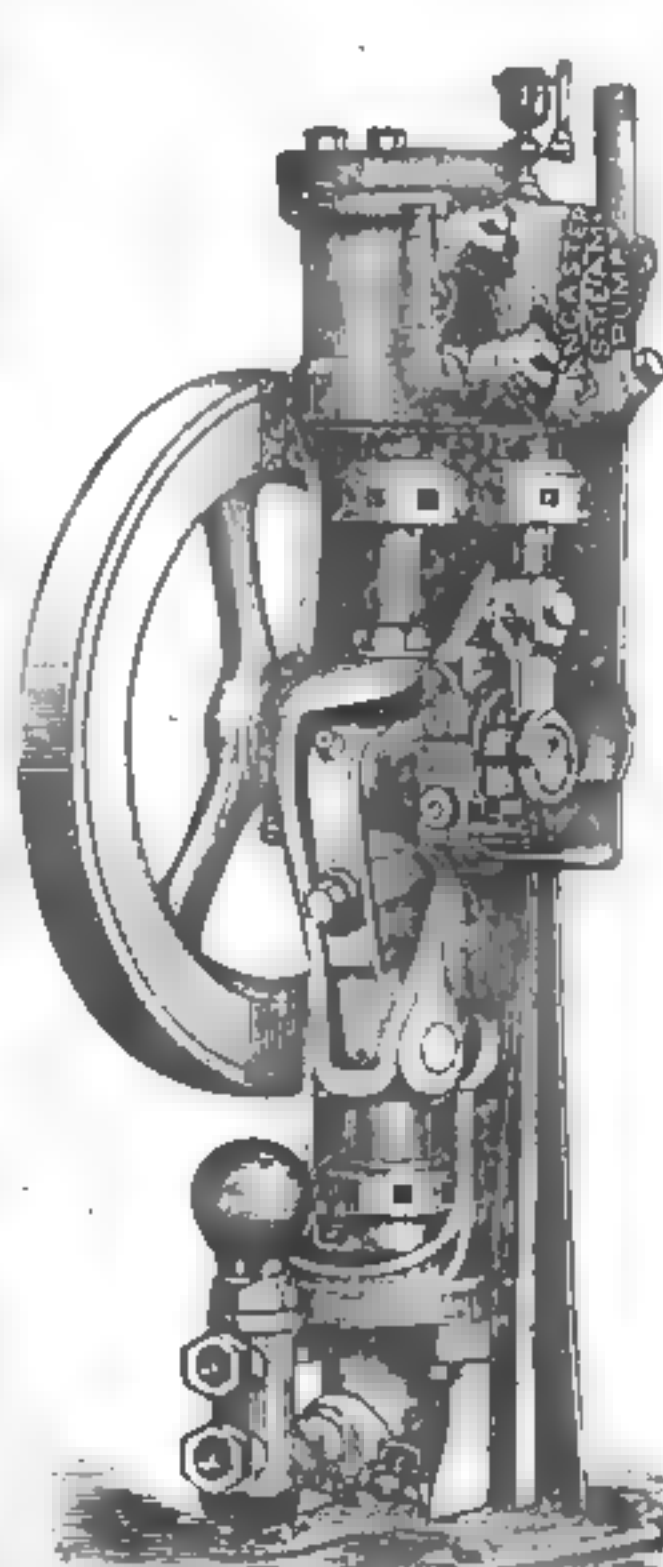
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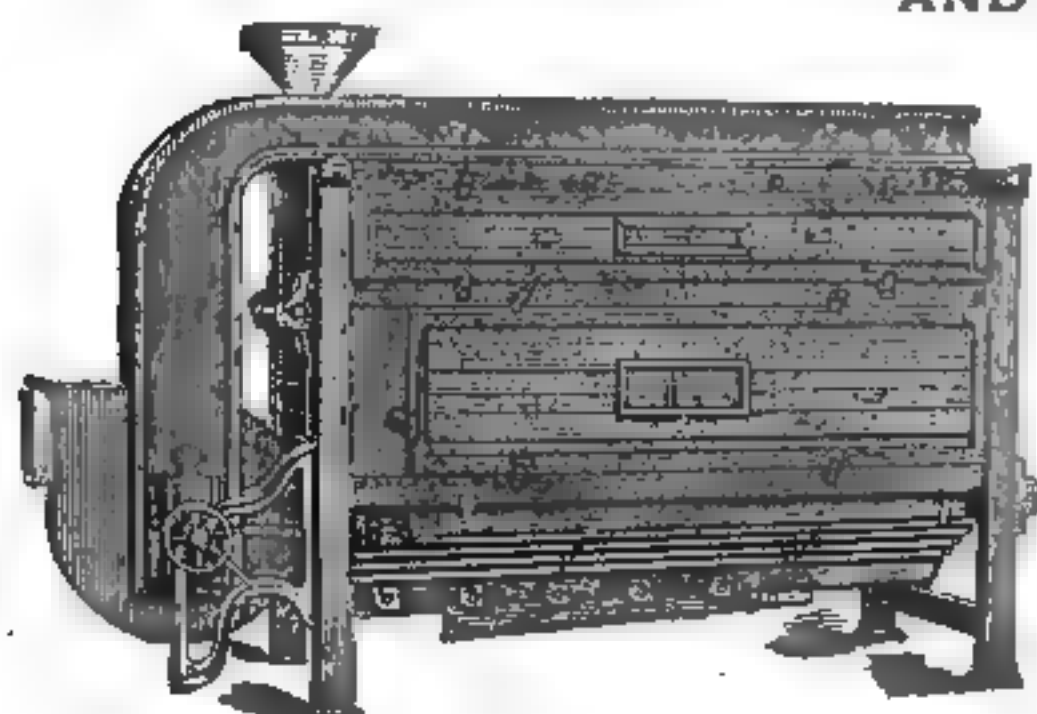
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THE PARIS BREAD QUESTION.

THERE are, says the "London Times," about 1,800 master bakers in Paris, and, though for now many years they have enjoyed absolute freedom in the exercise of their business, complaints are made that this industry is altogether behind the age. Machinery and improved methods of baking are alike neglected, and bread is dearer than it need be if only intelligently manufactured. In spite of these considerations, the majority of the Municipal Council, if free from outside pressure, would prefer leaving the matter to right itself. It is, they imagine, the fear of State interference that drives capital away. But for this danger the trade would attract investors, competition would render the introduction of improved machinery indispensable, a reduction in the price of bread following in due course. This argument has, however, been defeated by the influence of the workmen's party. It is urged on behalf of the latter that this reasoning does not take into account one important factor—namely, coalition. Practically speaking, the master bakers of Paris, though so numerous, are all united by a common interest, and some by a trade union of their own. Consequently they do not compete against each other, but, on the contrary, they contrive to maintain the high price of bread even when wheat is exceptionally cheap. Again, a merciless competition, if established, would only result in the extinction of the smaller bakers and place the trade in the hands of a few large capitalists, among whom a mutual understanding could be brought about with even greater facility. The old doctrine of *laissez faire*, *laissez passer* had, therefore, to be abandoned before the rising storm of popular indignation.

Some municipal councilors suggested that those bakers who consented to sell bread below the ring prices should receive special favor. They might be allowed the free use of municipal buildings and of public places, also to open bread stalls, and loans to cooperative societies were also proposed; but all such expedients were rejected on the ground that they could not affect the entire trade.

The council then fell back on the old policy of imposing a maximum price beyond which it shall be illegal to sell bread. So far this was a distinct concession to the demands of the workmen's party, whose members are to a man in favor of State intervention; but they insist on much more. They object that as competition below the maximum price, or tax, will still be possible, the master bakers, to preserve their present rate of profit, will probably now use improved ovens with new labor-saving machinery, and thus throw out of employ a number of journeymen bakers. M. Ghabert and M. Vaillant, therefore, went a step further, and, in response to the programme drawn up by the workmen's party, insisted that the Municipality should convert the bread supply into a public service. The State, they maintained, is alone able to break up the bread ring and hold the balance between the consumer, the bakers and their workmen. Therefore, they demanded that municipal bakeries should at once be organized, where journeymen bakers would receive good wages and the bread be sold at about its cost price. If private enterprise survived this competition on the part of the State, it would be on the double condition of paying good wages and of retaining but slender profits; otherwise, both workman and consumer would gravitate towards the municipal bakeries. Though the tax on bread was carried, this application of State socialism has not yet been

accepted; but, if the workmen of Paris continue to strengthen their party organization, it will not be long before other councilors, besides their special representations, adopt their views. We shall then witness a practical attempt to carry out socialistic principles, which, if at all successful with regard to bread, would certainly be promptly applied to other trades in the necessities of life, such as meat, artisans' dwellings, &c. Thus municipal trading on "collectivist" principles may be nearer at hand than generally supposed; and Mr. Herbert Spencer would find in the bread question now discussed in Paris, much to confirm his fears relating to the early advent of that State socialism which he has defined as "the coming slavery."

EUROPEAN TARIFFS.

(From Pappenheim's *Mueller Zeitung*.)

The most interesting question for the milling fraternity just at present is the tariff issue between France and Germany. While the grangers of France live in the hope that the high tariffs on flour and grain will be permanent, an exceedingly strong opposition, originating at Lyons, is gaining ground every day and assuming very formidable dimensions. The memorandum recently sent to the Minister of Commerce was a very decided protest against any tariff on food material, basing its request on the fact that, aside from an increase in the price of food throughout France, the acceptance of high tariffs would entail a decrease on the exports of the country by increased tariffs instituted by the countries whose export was affected by the new French tariffs, and which imported goods of French manufacture. How well the memorandum grasped the situation has been shown since in the action of the Austrian government which instructed its ambassador at Paris to give notice to the President of France, that Austria would institute retaliatory measures against French imports, if the high grain and flour tariffs were accepted. There cannot be any doubt that such measures would be exceedingly injurious to the French industry, which at present is in a very low state. If these protests are useless, the resulting evil is severe for both sides. Of exports from Austria-Hungary to France, valued at 126,000,000 francs per annum, 40,000,000 francs would suffer directly and the largest part of the rest would be more or less imperiled. In such a manner nations devour each other in the supposition that they benefit their citizens.

The parliamentary circles of Germany are strongly agitated by a proposal to increase the grain tariffs from 1 mark to 8 marks per meter centner. All indications point in a way that the proposal will be accepted by a large majority of the Parliament. This will react upon the Austria-Hungarian milling industry and place it in a not very enviable condition with regard to its exports. A very fair proposal was recently made for the interest of the milling industry. The principal market for any industry should always be found at home, and not until the supply exceeds the demand at home, should the export trade be inaugurated. The flour industry at present cannot afford any commission merchants, and mills should trade directly with the bakers. As however under the existing conditions bakers do not, or cannot, purchase flour in quantities large enough to obtain reduced railroad rates, it seems plain that such trade would increase largely if reduced freight charges could be obtained even for small quantities of flour. Our mills would gain in such a manner and we would be better able to furnish our home markets before thinking of export. We are often told in a very positive way that the prices of grain will rise towards spring.

So far, there are no indications of it; on the contrary, in spite of the large shipments to Europe, the stocks of grain increase in the United States and the supply exceeds the demand for both home market and export. In Russia large quantities of grain are kept back in the hope of future better prices, but as far as we can see, that hope is a very slender thread.

AUSTRALIAN FLOUR MILLS.

Some twelve or fifteen months ago, says the "Miller," it was pointed out then that considerable room for improvement existed in Victoria in regard to improvements in flour, more especially in connection with some of the country mills, where the flour produced was of such low quality that the reputation of the colony in regard to the production of this particular commodity was seriously affected in outside markets. At that time Mr. David Gibson, Melbourne, had recently introduced into his mill, with most satisfactory results, the new process of roller grinding, the old millstones being discarded, and the flour made by the new method was so far superior in quality to that manufactured with the old appliances that it realised a substantially increased price. Since then matters have gone on very much in the same way as before, so far as the country mills are concerned. The Water Mill Company, Loudon, however, have adopted the new Hungarian roller system of milling, and are now turning out a flour under this process which has been pronounced of first-rate quality and specially suitable for export.

Within a recent time the roller mill process has been adopted by Messrs. T. Brunton & Co., of the Australian Mills, situated at the corner of Spencer street and Flinders Lane, and, as in the case of Mr. Gibson, the change has turned out very satisfactorily, the roller mill flour realizing from £1 to £1 5s. per ton more than the article manufactured by the stone mills. The Australian Mills were established in 1869 with six pairs of stones, and the firm prospered so well that in 1880 it was found necessary to increase their manufacturing capabilities by adding seven additional stones, making thirteen altogether, with which the business has since been carried on. Some little time back Mr. Brunton paid a visit to Europe and America, and in the course of his travels he made it his special study to acquaint himself with all the latest improvements that had been effected in milling and flour-dressing appliances. He has now imported from England, Hungary, and America a complete set of the roller mill machinery, which is in full working order. In connection with the plant there are four sets of Fanz's patent rollers, which are of grooved chilled cast iron. The rollers are fitted in pairs, one pair being placed above the other, the grooves round the circumference of the upper pair being coarser than those round the lower. As these mills are intended for the manufacture of the best quality of the wheat to be put through the rollers, all inferior or damaged grain is rejected. First of all the wheat, after being carefully examined, is put into one of Boddington's warehouse separators, where all the straw and foreign matters are taken away, the dust and chaff being extracted by a powerful fan. The grain is then lifted to the top of the mill and passed through a Eureka smutter, which pulverizes all smut balls, the dust being carried away by a powerful fan. The wheat then finds its way into the store bins, which have a holding capacity equal to 6,000 bushels. Thence it is taken up and passed through two brush machines, where it receives a thorough scrubbing, and is made perfectly clean. It is then lifted to the roller bins, or to the old millstone bins, according to desire, and again passes over a large suction fan, from whence the stones and rollers are

fed. It is claimed that the patent rollers, or the system of milling by gradual reduction, as it is otherwise called, produces a stronger and a cleaner flour than is possible with the millstones.

Another and a very substantial advantage is gained from the use of the roller mills, as it has been proved by actual test that the patent flour contains more gluten than the ordinary commodity, and gives more bread to the bag. On the wheat going into the rollers, the first and second break of the grain is effected by three double sets of Ganz's No. 21 rollers; then the meal is taken up to one of the Walworth's scalpers, which separates all the bran, middlings and flour from the "breaks." The flour is then passed through a centrifugal Luther's and Bedford's, the returns from which, as well as the middlings, are then carried over three of Hunter and Higginbottom's purifiers, which extract all the light brown impurities that tend to discolor the flour. Already the firm has received very gratifying proof of the high regard in which the flour manufactured by their new process is held. In March last, a test of the quality of flour from the only three steel roller mills then at work in Australia, was made at the establishment of Mr. A. Shadler, the principal baker in Sydney, who has branch establishments in various parts of New South Wales. The mills represented were situated in Adelaide, Goulburn (New South Wales) and Melbourne respectively, the last named being Mr. Gibson's. Of each sample of flour, 20 lbs. was mixed with a like quantity of water, the test resulting slightly in favor of the Adelaide sample, which produced 30 lbs. 2 oz. of bread, while each of the others produced 30 lbs. exactly. When Mr. Brunton got this plant into working order, he sent a sample to the same establishment for the purpose of having its merits tested; and he has received a communication from Mr. Shadler, who says:—"The result is that I have never seen its equal for both strength and color. It eclipses any roller flour I have hitherto used, and the miller deserves the greatest praise." As an earnest of his appreciation, Mr. Shadler has given an order for 100 tons of flour at the full price of £9 10s., f.o.b. at Melbourne.

Mr. Brunton has no intention of casting aside his old servants, the millstones, by the aid of which the firm has been assisted to its present prosperous position. The roller mill will turn out about 1,500 bags per week, working night and day, and the output of the 13 millstones is about 2,800 bags, making the total producing capability of the mills about 4,300 bags per week. The buildings, which comprise four stories, in addition to the basement, are sufficiently commodious to provide abundance of space for the working of the whole plant, and the firm has storage accommodation for 32,000 bags of wheat. The motive power by which the new roller mills are driven is a high pressure engine manufactured by Messrs. Hughes, Pye & Rigby, of Melbourne, the steam for which is supplied by a multitubular boiler made by the Langland Foundry Company. The motive power for the stone mill is supplied by separate engine and boiler.

VANDERBILT'S CHRISTMAS.

The New York World says; A cloud rests upon the house of Vanderbilt. While the whole world is ringing with the glad tidings of Christmas, gloom and disappointment fill this family of the mighty. The poor clerk, struggling with the difficult problem of how to save \$10 out of his slender salary for holiday cheer is happier than the richest man in America. This is no picture—it is a fact. William H. Vanderbilt on this Sunday morning awakes infirm in health and disappointed in ambition. The great railroad created by his father is no longer his save in name. Its prestige in the finan-

cial world has been seriously impaired. Its dividends have been reduced. Its bonded indebtedness has been increased. Its financial statements reveal a sad deficiency. A new rival running parallel with it up the Hudson and across the State is sharing in the business of which it once had a monopoly. His sons, to whom his vast property is to pass, have disappointed him. He looks into the future, and is confronted with many doubts as to the ultimate fate of the estate which his father created and he has preserved. Two of his sons have made such sad havoc of the millions left them by their grandfather as to cause many doubts of their ability to preserve the greater riches to be inherited from their father. One of the sons is already a pensioner on the head of the house, and another is also receiving assistance from the same hands. Both were left independently rich by the founder of the family. Both have squandered their substances in riotous speculations in Wall street.

These facts are well known in financial and society circles. They are the common gossip of the clubs, of the long-room and of the ball-rooms. Of course, no authoritative statement that would represent the facts of the case can be obtained as to William H. Vanderbilt's health. Those who have seen him speak of his listless manner and the heavy lines on his face, and maintain that he cannot be well. The sudden interest that he has manifested in his tomb on Staten Island, gives some color to the reports that his physicians have warned him of the progress of disease. To a man of courage and strength of mind such a warning is not so terrible as it might seem, but to Vanderbilt it comes as only a

part of the message. The other part is that in which is told the incapacity shown by his two elder sons to manage their own property. The head of the house finds himself, in his decline, in doubt as to the ability of any one of his sons to perpetuate his property. To one who makes money his sun and who worships fire, this is a bitter pang. No wonder that the Vanderbilts are taking no active part in society this season. No splendid ball is expected this year, such as was the glory of the season before last. William H. will doubtless continue his art receptions after the holidays, but this will probably be all that he will do in the way of social entertainment.

W. K. Vanderbilt, his son, is living very quietly with his family in his marble palace close to the parental mansion. There has been some talk that he would go to Europe, and in case his house is sold he may do so. It is generally understood that the marble house is for sale. Of course no bill with "For Sale" on it is displayed, and it would beneath the family dignity to place the property in the hands of a broker, but there is no doubt that if any of the readers of The World will make a fair offer for it a purchase can be effected.

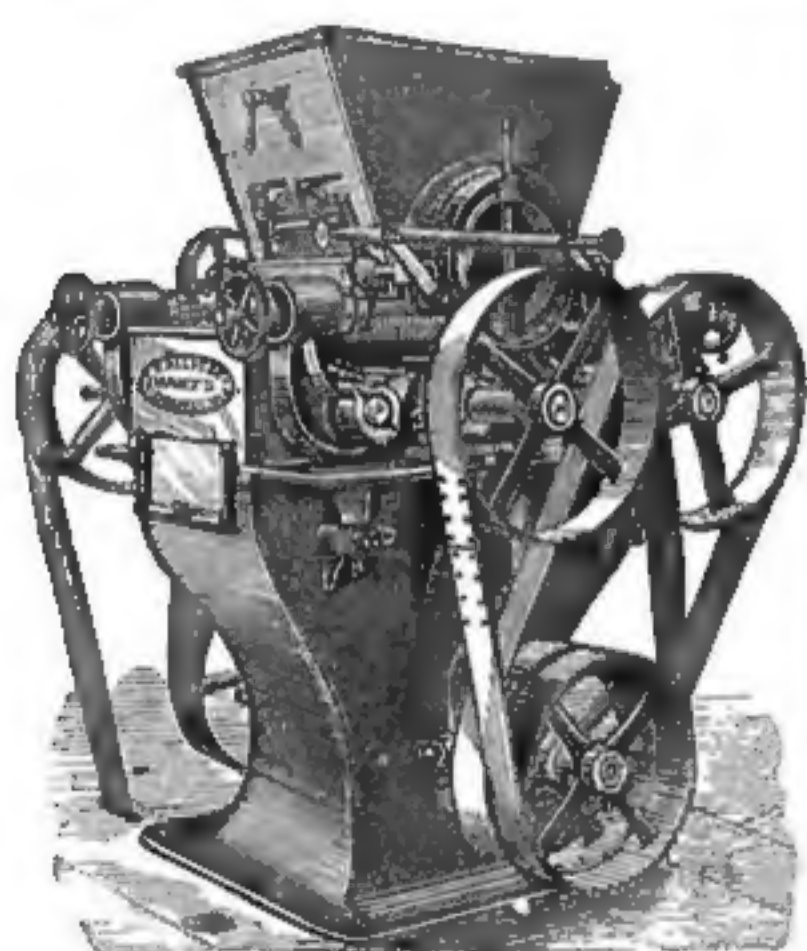
For the first time in his life William H. Vanderbilt has been called upon to render pecuniary aid to his sons. William K., it is generally understood, is "dead broke." It is not so publicly known that he has been pensioned by his father at the rate of \$5,000 per month or \$60,000 per year. Some put the amount at \$70,000. W. K. received \$2,000,000 from his grandfather. This, by fortunate investments, he doubled or more. He purchased his big house, furnished it

with princely magnificence and spread himself grandly, both in society and in Wall street. There is no more dangerous period in the life of any financier than just that time when his friends have persuaded him that "he knows it all," and is the noblest financier of them all. It is a blissful moment while it lasts, but it is always followed by ruin. This describes W. K.'s career in Wall street. The "World" some months ago published the reported bursting of his speculative bubble. He bought heavily of all kinds of securities at high prices for a rise and the terrible shrinkage in values left him with a load of stocks that he could not carry. It was reported at the time that his father came to his aid with pecuniary assistance. This William H. denies. Vanderbilt denials, however, are notoriously of little value, as shown in his denial recently of the proposed issue of new Central bonds a few weeks before they were thrown on the market and after they had already been printed. It is well understood that William H. assumed his son's entire line of stocks. He did this at a loss to himself, but his son was already stripped. That the elder Vanderbilt has disposed already of these securities is inferred on the street by the fact of his present position in the market. The proudest moment in the millionaire's life was when he sold 300,000 shares of Central stock to a syndicate four years ago at 120 and 130, guaranteeing an 8 per cent. dividend for five years. He was prouder still, perhaps, when he was able to keep his promise, though to do so apparently crippled the financial resources of the road. It is now believed by many on Wall street that Vanderbilt's interest in the Central is more imaginary than real, and

that his holding of the stock is very small.

The other son, Cornelius who was left, \$5,000,000 by his grandfather, after whom he was named, has also been unfortunate in Wall street, though he is generally credited with being a fair business man. Besides he is a churchman and a vestryman. The particular rock against which he split was Lake Erie and Western. It is believed that very nearly all his inheritance has been lost. The total Vanderbilt losses in Wall street are estimated at \$50,000,000. Cornelius is also keeping very quiet in society this winter. The other two sons, Frederick and George, have made better use of the million apiece left them by their grandfather. Frederick, it is curious to note, has been speculating on the bear side of the market and while the depreciation in prices has impoverished his two elder brothers it has added to his wealth and with the old family mansion given him by his father he is comparatively happy.

George was a minor when he received his million, which was invested in Central stock. A year or so ago when he became of age his one million had become two. George, who is a trifle deaf, resides with his father, and is the happiest of the family. He is a student. William H. lacks the business ability of the old Commodore, but he is more domestic. He loves his family and delights to do more for them than his father did for his relatives. He was chosen by the Commodore to bear the burden of the family estate because he was the choice of two evils. As it has turned out, William has proven a fairly efficient trustee. The problem is whether the next generation will be able to hold the estate together.



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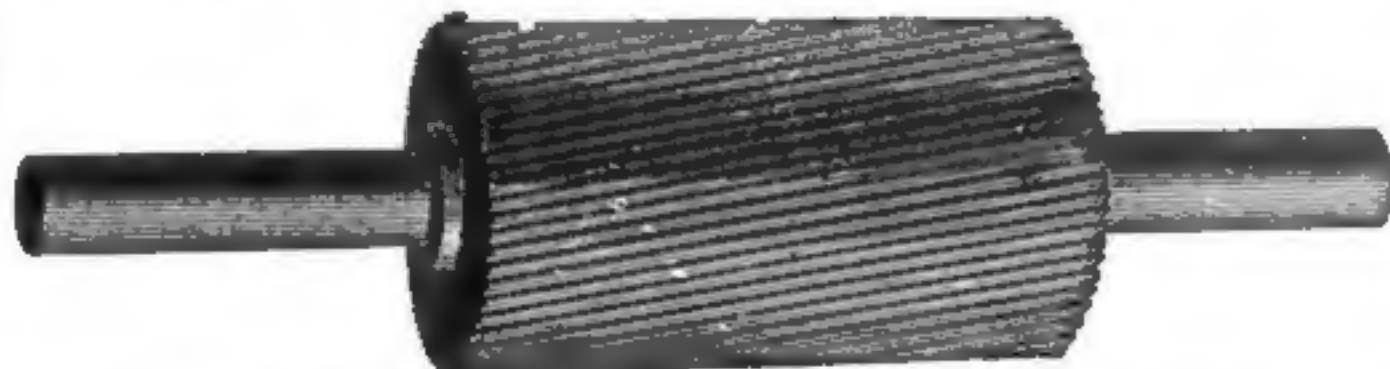
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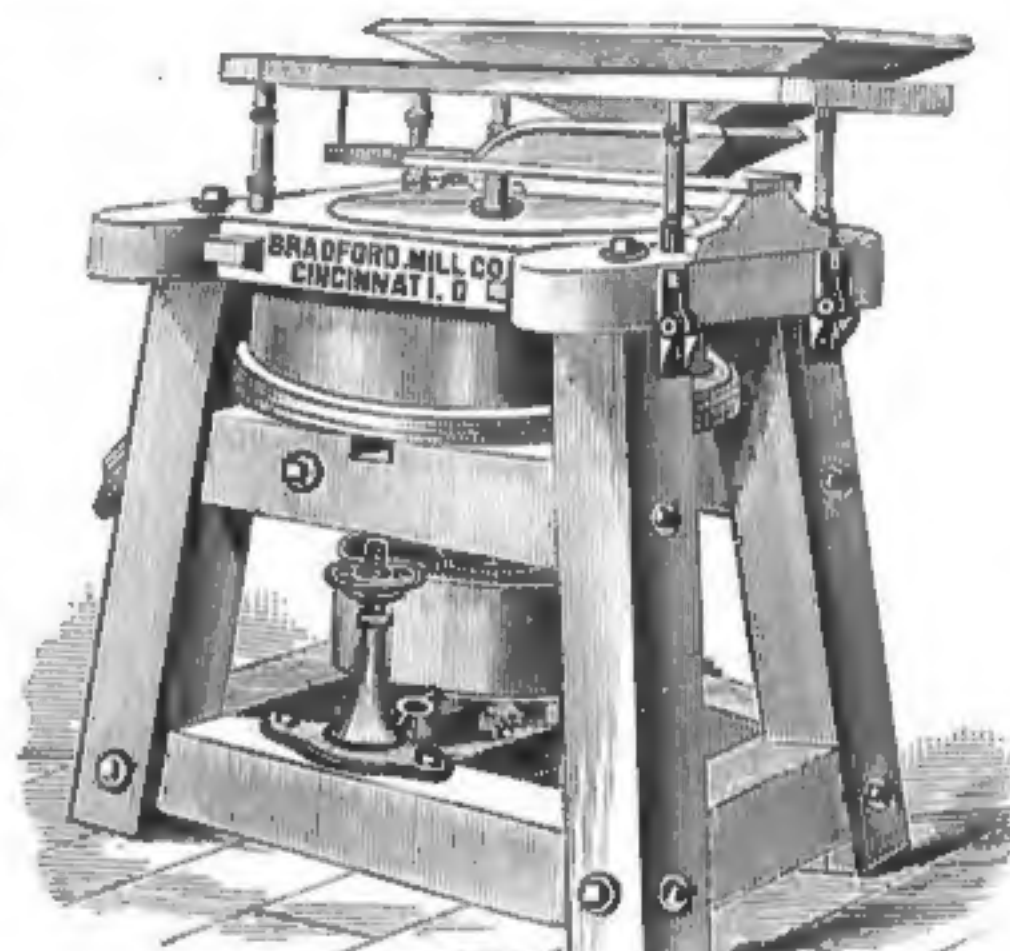
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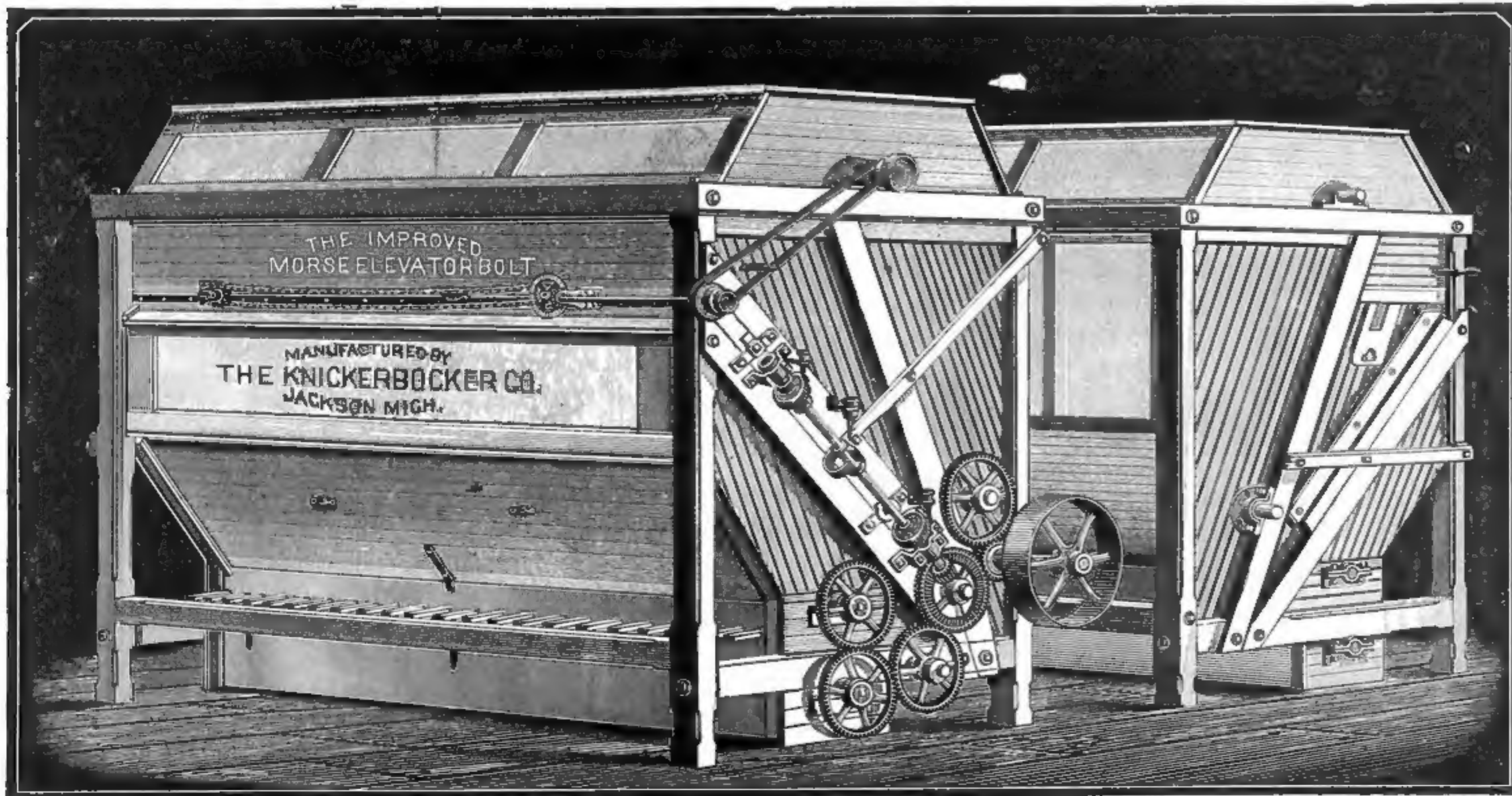


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DEMONSTRATED IN OVER 100 MILLS TO BE THE BEST BOLTING DEVICE KNOWN.

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GOLD MEDAL—SPECIAL, 1ST ORDER
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Picks will be sent on 30 or 60 days' trial to any responsible Miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada.

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Toledo Mill Picks and Stone Tool Mfg. Co.

Manufacturer and Dresser of
MILL PICKS.

Made of the very best double-refined English cast steel. All work guaranteed. For terms and warranty, address GEO. W. HEATLEY, No. 297 St. Clair Street, Toledo, O. Send for Circular.

N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF
SHAFTING, PULLEYS, HANGERS, COUPLING
AND MACHINE JOBBING.



Office of THE MILLING WORLD,
Buffalo, N. Y., Dec. 31, 1884.

One naturally looks for dullness and apathy in the grain and flour markets at this season, yet we are told by the New York Commercial Bulletin that the conduct of the breadstuffs market Saturday and Monday has, doubtless, been a genuine surprise to a majority of the trade who had prepared themselves for the usual period of holiday apathy. Tuesday's market for grain was active and excited, with a rattling advance all along the line of speculative options. Here the improvement stops, or rather it should be said that the excitement in the grain market is almost wholly due to speculative influences and methods, and that in the more legitimate departments of trade there is a disposition to follow at a respectful distance, and there is extant a feeling of distrust as to the staying qualities of the improvement, although many choose to regard the gain as substantial, and, with the usual allowance for reactions, permanent and prophetic of better business ahead. Exporters have not been able to get in any good work—the further advance of 1a.2c being too much for them, but the market closes with holders very strong on the cash property and figuring for the best prices of the day. Speculation has been energetic, with a larger manifestation of outside interest and a good deal of short covering. The cable advices are of bullish purport; the interior movement is interpreted as having a bullish significance, and the reduction in the New York stock serves also a bullish purpose.

The flour market at large is in decidedly firmer form, not only in keeping with the late advance in the price of wheat, which may be very largely an affair of speculation, but on the more substantial basis of a falling off in the movement from the west. A subsiding movement is still indicated by the small number of bills of lading that are arriving. Spring wheat flours are holding a very strong relation to the general market, and some receivers are reporting an advance on the best known brands of 15a.20c. per bbl. from the lowest figures ruling a week ago. The strength of the market is found chiefly in the best class of patents. The very low shipping grades also held with much firmness, because they are scarce rather than because they are wanted. The intermediate qualities are doing better—that is to say all forced selling is over, and holders announce a much firmer set of views respecting the future. The market also shows more activity. The talk from the west is very "bullish," and higher prices are demanded to justify full capacity grinding. The demand for rye flour is moderately active, with the market steady in tone at quotations appended. Buckwheat flour continues dull and without change in prices; the market is rather feeble in tone, with \$1.85a. 2.05 representing the general business, and \$2.10 an extreme price for fancy lots. For corn goods there is a slow demand, and without decided change in prices, buyers holding off, while holders are firmer in their views. Mill feed fairly active, with coarse feed decidedly firm and scarce. The arrivals of track stuff, actual and prospective, very light.

FOREIGN EXCHANGE.

Foreign Exchange was dull, but fairly steady in tone. Posted rates remain 4.81 and 4.85. Actual rates were 4.80 1/4 a. 4.80 1/2 for sixty days, 4.84a.4.84 1/2 for demand,

4.84 1/4 a. 5.85 for cables and 4.78 1/4 a. 4.79 1/2 for commercial bills. Continental bills were very quiet and quoted as follows: Francs, 5.25a.5.24 1/2 and 5.22 1/2 a. 5.21 1/2; reichsmarks, 94 1/4 a. 94 1/2 and 94 1/4 a. 95; guilders, 39 1/4 a. 39 1/2 and 40 1/4. The closing posted rates were as follows:

	60 days.	30 days.
London	4 81	4 85
Paris francs	5 28 1/2	5 20
Geneva	5 22 1/2	5 19 1/2
Berlin, reichsmarks	94 1/2	95 1/2
Amsterdam, guilders	40	40 1/2

BUFFALO WHEAT MARKET.

BUFFALO, N. Y., Dec. 31, 1884.

There has been a sharp advance in our Northern Pacific wheat owing to large orders received in New York for export. About 120,000 No. 1 hard sold Monday at 84 1/2 to 86c. Tuesday good demand, but holders asking 88c, which is about 1c more than the limit for New York orders. Large lots could be placed at 87c. No. 1 Northern in good demand, but very little here outside of what is held by millers. Holders of winter wheat have got their ideas up above what our millers will pay, therefore no sales made. Corn in fair demand for carloads on track at 42 1/2 a. 45c. Oats very little doing, some car loads sold at 31 1/2 for No. 2 White on track.

J. S. MCGOWAN & SON.

BUFFALO MARKETS.

FLOUR—City ground clear Northern Pacific spring \$4.50@5.00; straight Northern Pacific spring, \$5.00@5.50; amber, \$5.00@5.15; white winter, \$4.75@5.25; new process, \$5.50@6.00; Graham flour, \$4.00@5.00. Western straight Minnesota bakers, \$4.75@5.00; clear do, \$4.50@5.00; white winter, \$4.75@5.25; new process, \$6.00@6.50; low grade flour, \$2.50@4.00. OATMEAL—Ingersol \$5.75; Bannerman's \$6.00; Akron \$6.25. CORN-MEAL—Coarse, \$1.00; fine, \$1.10 per cwt. RYE FLOUR—In fair demand \$4.00@4.25. WHEAT—Active and firm. Sales 5,000 bu No. 1 hard Northern Pacific at 84 1/4, 47,000 bu do at 85c, four car-loads do at 85c; at the Call Board, 10,000 bu do at 85c, after which 88c asked 85c bid cash and Dec., 90c asked 88c bid May. For No. 1 Northern 88c asked 85c bid May, 81c bid cash. Winter wheat better; sales 6,000 bu No. 2 red at 81c and 7,000 bu No. 1 do at 82c. CORN—Scarce and firm. Sale sixteen car-loads No. 2 at 46c; 42 1/2c asked 42 1/2 bid May. OATS—Quiet. No. 2 white 31 1/2@32; mixed Western 30c; State from wa., ons 22@23c. BARLEY—Sale five car loads Canadian at 69c. RYE—State nominal at 53@54c. and Western at 58 1/2@59c. FEED—Coarse, quoted at \$13.00; fine, \$14.00; finished, \$16.00 per ton at the mills.

AN OAT-MEAL KING.

Ferdinand Schumacher, says the Philadelphia Times, is known as "the oat-meal king." He is a German and came to this country thirty years ago. He settled in Akron, Ohio, where he is to-day one of the leading and wealthiest men of the place. Twenty years ago he was poor as a church mouse. In a little wooden shanty on the outskirts of the town he prepared the first American oat-meal in an iron kettle. He made it satisfactory to himself, and obtaining a small hand-cart peddled it about town gratis, asking the people to give it a trial. They liked it and he started a small factory, doing all the labor himself. His business prospered. Oat-meal was a new article of diet. Fifteen years ago it was impossible to obtain an order of oatmeal at the best hotel in America. To-day it is to be found upon every breakfast table in every civilized land. From that small beginning Schumacher has built an enormous business. He owns half a dozen mills, two large grain elevators, and several warehouses, and employs upwards of a thousand men and women.

Schumacher is a peculiar man. He is small, thin and wiry—in fact, a regular little bundle of nerves. He is a man of 50 or more, with a small gray chin-beard and a high forehead. He lives in an elegant brick mansion on Market street, in the city of Akron. In his stables are fine horses and costly equipages, yet for his own use he drives a single horse with an old-fashioned open buggy. He is at his mills as early as 7 and remains until 6 or later in the evening.

He is a busier man than anyone in his employ. He flashes in and out among his buildings, offices and apartments. He is always in a hurry. His gait is a half walk, half trot. Frequently he leaves his horse behind and flutters about town from the banking houses to his offices and vice versa, trotting along at a terrible rate, swinging his hands and talking to himself. When he rides his horse never goes fast enough for him and he leans forward, his hands over the dashboard, pulling with sharp, quick jerks at the reins. Every pull at the reins seems to indicate that there has been another dollar earned.

Schumacher's business offices are the finest in the county and as elegant as anything of the kind in Ohio. They are located in a three-story building of cut stone and plate glass, with granite trimmings. Schumacher spared no expense in constructing his buildings or in furnishing his offices. He is not a close-fisted man, but gives liberally to charitable institutions, and furnished one-third the capital to build the Akron Universalist church, of which he was a member. He is a strong Prohibitionist, and was a candidate for Governor of Ohio on the Prohibition ticket a few years since. He will not employ a drinking man in his mills. Nearly all of his workmen are Germans, yet they are strictly temperate. They have learned to relish a drink known as oat-meal water, even better than they did their beer in the Faderland. Once each year Schumacher gives his employes a picnic, and every New Year's day invites them to feast at his house.

The one great peculiarity of this wonderful man is his personal attire. He owns two suits of clothing. One is a dress suit which he wears only on Sunday, and the other is a cheap, ready-made affair, white with the dust from his mills. This is his business suit. He wears it everywhere—in the mills, offices, on the street and at home. To an overcoat he is almost a stranger. Half of his employes are better dressed. He looks shabby and his sons are put to shame at times by his costume. Last winter the boys prevailed upon the old gentleman to purchase a new overcoat. He threw up his hands in horror. He did not need a new coat and, besides, he could not afford it. The sons went to their tailor. They instructed him to sell their father a new overcoat at the first opportunity and at a small figure, much below its actual value.

"Send us a bill for the difference in the amount," they said, "and we'll foot the bill. But we want dad to get a new overcoat somehow or other."

Some days later Mr. Schumacher dropped in at the tailor's to inquire after a vest he had left to be mended. The tailor displayed a fine overcoat on the counter and spoke of its good qualities.

"What you want for it?" asked the oat-meal man hurriedly.

"As much as you will give," replied the tailor.

"All right. I'll give you fifteen tollars."

"The coat is yours," said the tailor, and he helped the oat-meal man to place it on his back.

Schumacher went out of the store after having paid the \$15, his face radiant and feeling good over his great bargain. When he reached home that night he remarked at the table:

"Vell, I bought an overcoat to-day."

His sons were enraptured, and each mentally tendered the tailor a vote of thanks. Then Mr. Schumacher continued:

"It was a great bargain, and I made as much money off dot coat in five minutes as most young fellows make in a whole day."

The young Schumachers were deeply mystified until their father continued:

"I paid \$15 for the coat. Ven I got two squares away Charlie Boustedt, he comes up

and asked me what it cost. I laughed and wouldn't tell him. So he feels of the goods and says he'd give me \$20 for one like it. I told him I'd sell him mine mighty quick, and I did. I give him the coat and got my \$20, and so I'm \$5 ahead.

The old man laughed heartily, while his sons looked very sober. The overcoat cost \$60. The sons raised the \$45 due to the tailor and paid it quietly. All last winter Ferdinand Schumacher wore his overcoat of the winter before. This year the boys will probably read him the riot act, and make it compulsory for him to purchase a new overcoat and wear it.

HOW HE SUFFERED.

Several men were seated in the back room of a saloon discussing the late war. All of them had been in the Confederate army, and each one thought that he had undergone the most dreadful sufferings.

"I had a putty tough time of it at Vicksburgh," remarked one. "There may be some parts of a mule that are tender and juicy, but the mule meat issued to us had to be boiled three days before it was as tender as an India rubber overshoe."

Another spoke up and said:

"After the battle of Gettysburg, I rode nine miles to an hospital, on a caisson, with a broken leg."

"I never saw a caisson, but I lived for three weeks on an ear of corn a day, just before Lee surrendered, and I fought Yankees every—day," said another.

"So did I, except that we didn't have the ear of corn,"

A shabby, dilapidated looking man, who was sitting near the stove, spoke up:—

"I, too, upheld the conquered banner, and no tongue can tell what I have suffered."

"Where were you wounded?"

"Here, in my heart. I underwent no physical anguish, but my heart was with the South. I was afraid she would not succeed."

"You managed to pull through, didn't you?"

"Where were you stationed during the war?"

"I followed the Bonnie Blue Flag principally in the Lower Rio Grande at Brownsville, and as far as rations were concerned, I could not complain. The Confederate Government shipped large quantities of cotton to England through Mexico, and received supplies from Mexico in return, so we never run short of coffee, tea, sugar, cured hams, flour, the crackers, cheese, etc. In addition to these things we received our regular ration of fine-cut chewing tobacco and whiskey, and the best of it was that there was not one Yankee soldier within 1,000 miles."

"Well, you must have suffered," remarked one of the ex-Confeds. contemptuously.

"I can't say," resumed the hero; "that I suffered very much physically, but the mental strain was terrible. We never knew when we might be ordered to the front to fight the Yankees."

"Were your worst fears realized?"

"They were. We were ordered to Virginia to surround Grant, and then I went over into Mexico and was a clerk at \$200 a month in gold, until Lee surrendered. Gentlemen, when I think of those days that tried men's souls, I wonder how we managed to stand it, but one thing is sure, I am never again going to raise my hand to destroy the union of our fathers. Isn't any of you boys going to treat?"

JAMES S. MCGOWAN & SON,
SHIPPING AND COMMISSION MERCHANTS.

Choice Milling Wheats a Specialty
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BUFFALO, N. Y.

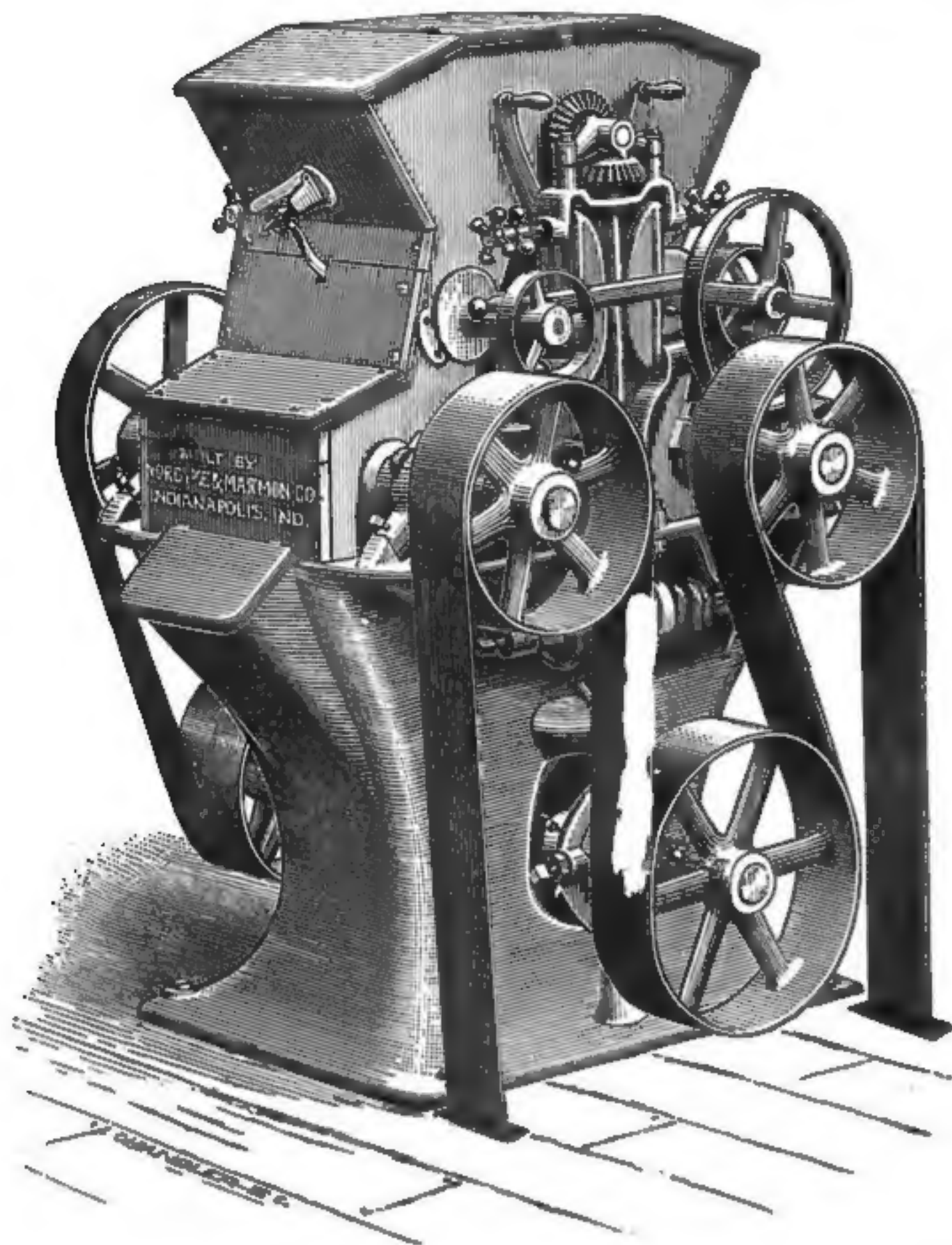
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WE ARE THE SOLE OWNERS FOR THE UNITED STATES OF ALL THE PATENTS UPON THIS ROLLER MILL.



This Is the Only Roller Mill Made Having All the Essentials Needed In Successful Milling.

800 BARREL MILL IN MISSOURI.

Read what an Old Miller who has Thirty-Four Pairs of these Rolls in Constant Use, Says:

MESSES. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: In regard to the workings of our new mill erected by you, will say it is fully up to and beyond our expectations. Our average work is fully 88 per cent. over your guarantee. Since starting our mill last July we have had no complaint of our flour from any market where sold. It gives universal satisfaction, and we have it scattered on the trade from Chicago to Galveston, Texas. Our yields are all that are attainable. We have tested it on both Spring and Winter wheats with satisfactory results on both varieties. Since the mill was turned over to us we have not changed a spout or a foot of cloth, nor have we found it required to make any changes. We have run as long as six days and nights without shutting steam off the engine, not having a "choke" or a belt to come off. The mill is entirely satisfactory to us, and for a fine job of workmanship, milling skill and perfection of system, we doubt if it is surpassed in the United States to-day. It is certainly a grand monument to the ability and skill of Col. C. A. Winn, your Milling Engineer and Designer. You may point to this mill with pride and say to competitors, "You may try to equal, but you will never beat it." Wishing you the success that honorable dealing deserves, I am,
Yours, etc., R. M. FAUCETT, PRES.

OFFICE OF DAVIS & FAUCETT MILLING CO.,
ST. JOSEPH, MO., Nov. 28th, 1883.

800 BARREL MILL IN ILLINOIS.

MESSES. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gents: We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we could not know where to purchase as good.
Yours respectfully,
DAVID SUPPGER & CO.

OFFICE OF DAVID SUPPGER & CO.,
HIGHLAND, ILL., Jan. 10, 1884.

125 BARREL MILL IN INDIANA.

NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: The 125 barrel All Roller mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading mill furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantee, and the capacity runs over your guarantee. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.
Yours truly,
J. T. FORD.

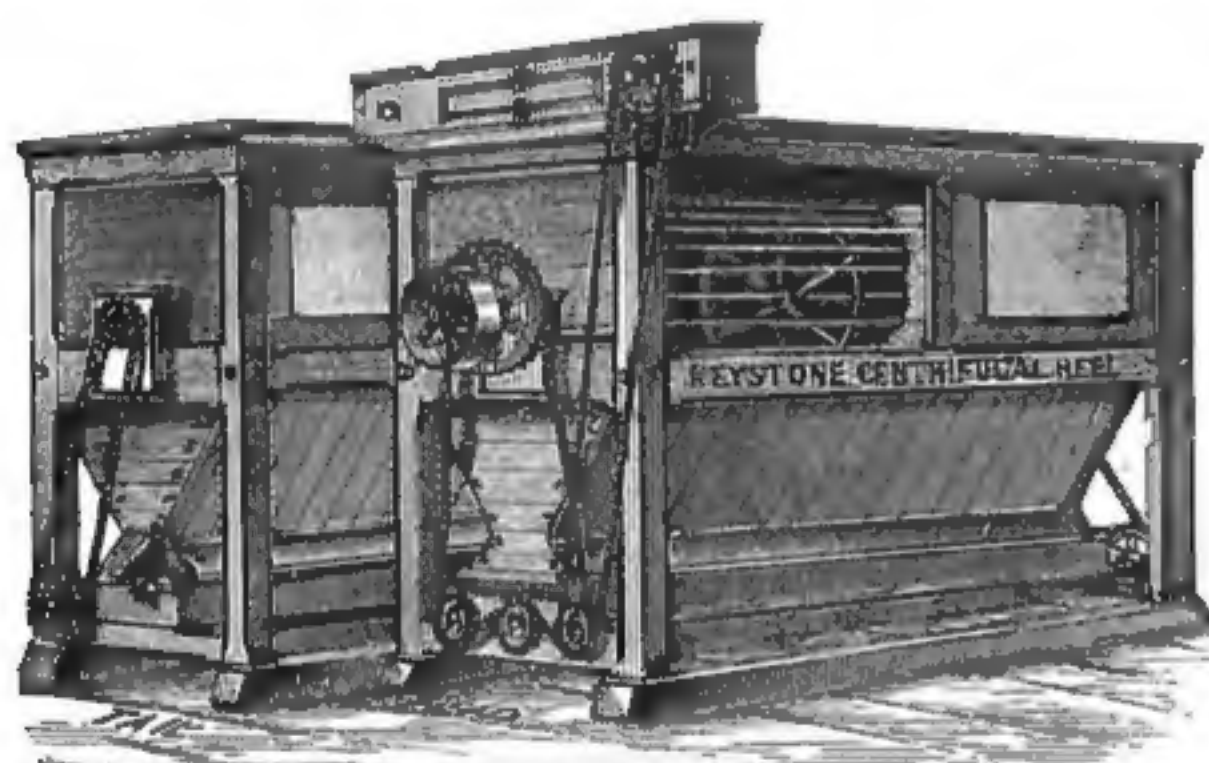
LAPEL, MADISON COUNTY, IND., Jan. 10, 1884.

Letters on file in our office from a large number of small roller millers giving as favorable reports as above. A portion will be published as occasion demands.

SPECIAL MILLING DEPARTMENT!

Mill Builders & Contractors--Guarantee Results

Motive Power and Entire Equipment of a Modern Mill Furnished under one Contract.



KEYSTONE CENTRIFUGAL REEL

—PATENTED MAY 6th, 1884.—

Drag Brush Feed, Tightest Heads, Best Results. Cheapest and Best on the Market. Adapted to all Kinds of Milling. The New Drag Feed Thoroughly Protects the Silk. Sent on Trial to any Responsible Miller.

ROLLER MILLS, SCALPING REELS, PULLEYS, SHAFTING AND ALL KINDS OF MILL IRONS.

Full Stock of Dufour and Dutch Anchor Bolting Cloth.

BEST QUALITY FRENCH BURR MILLSTONES, FOR MIDDINGS, WHEAT AND FEED.

Leather, Rubber and Cotton Belting, Smut Machines, Purifiers and everything belonging to a Flour Mill furnished at Lowest Market Prices. For Circulars, Prices and Full Particulars, address the Manufacturer,

C. K. BULLOCK, 1357, 1359, 1361 RIDGE AVE., PHILADELPHIA, PENN.

UNION STONE CO., BOSTON, MASS.

PATENT MILLSTONE CEMENT.

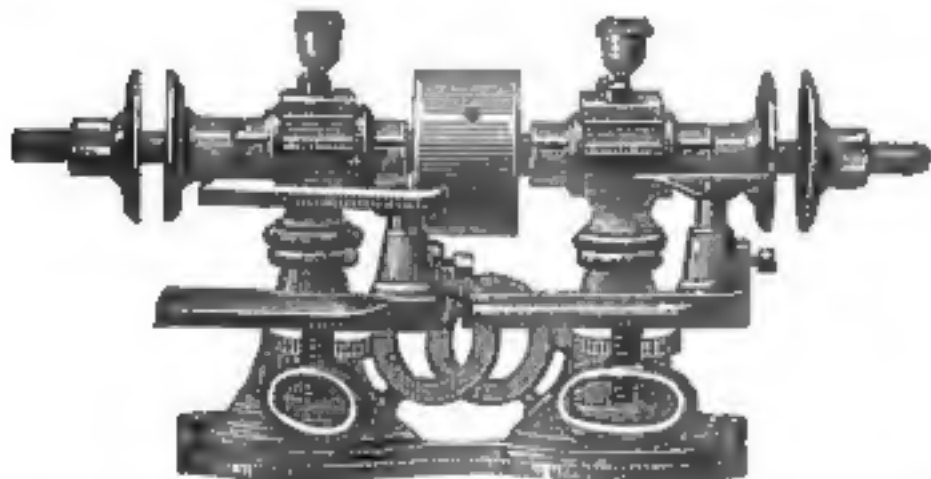
Invaluable to Millers for Repairing and Filling the Joints,

This is a new article of manufacture, and is greatly superior to the preparations now in common use, containing nothing of a poisonous nature. It has the nature and attains the hardness of a part of the Stone, and assists in grinding. Good Millstones are now in use, composed of miller's use, it is put up in cases of two sizes. Price per case: Small, \$3.00; Large, \$5.00. Otherwise we shall send C. O. D. by Express, collecting for return of the money. For manufacturers, the Furrows and



Cavities and Seams in French Burr and other Millstones.

use by millers. It is much cheaper, and can be applied by an inexperienced person. It is perfectly of French Burr Stone, wears evenly with it, and not only fills the cavity, but adheres to and betirely of this preparation. The Leading Makers are Adopting it to Build Their Millstones. For We cannot open an account for so small a sum, therefore Cash should be sent with order, otherwise we furnish in bbls. of 800 lbs. Price upon application. Emery Rub Stones, for hand use in Finishing Faces of Millstones.



Emery Wheel Machine No. 0 Has 3/4 Inch Arbor.

Union Stone Co., 38 & 40 Hawley Street, Boston, Mass.

PATENTERS AND MANUFACTURERS OF THE

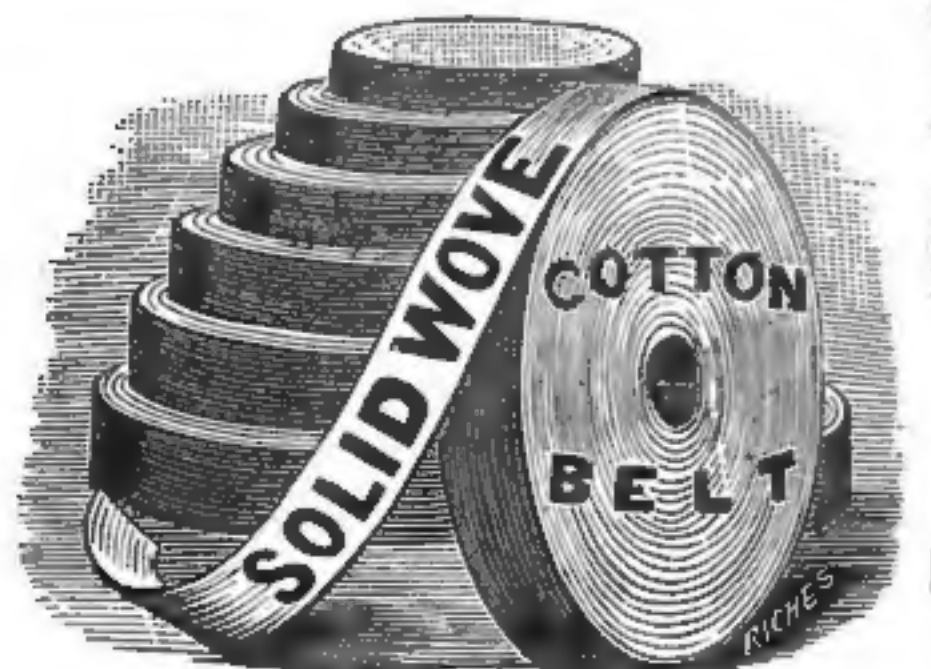
Union Emery Wheels, Emery Wheel Machinery and Tools a Specialty. Wooden Polishing Wheels, Automatic Knife Grinding Machines. Grinders' and Polishers' Supplies. Catalogue on Application.

EMERY, QUARTZ, CORUNDUM.



DIAMOND TOOLS,

FOR DRESSING OR TRUEING EMERY WHEELS



MILL SUPPLIES { Everything Used in a Mill of Every Kind Always on Hand.

Leather Cotton Rubber } BELTING, BOLTING CLOTH

ELEVATOR BUCKETS, BOLTS, MILL IRONS, &C.

Prices Close and Quality the Best.

The Case Mfg. Co., Columbus, Ohio.

ROLLS RE-GROUND

And Re-corrugated to order. Porcelain rolls re-dressed. Our Machinery for this purpose is very accurate. Can do work promptly.

Case Mfg. Co., Columbus, Ohio.

TEN GOOD SQUARE JUMPS

From the engine house of The Geo. T. Smith Middlings Purifier Company, at Jackson, Michigan, the Eldred Milling Company is erecting a 250-barrel flour mill.

It will be equipped with SMITH PURIFIERS, SMITH CENTRIFUGALS, and

THE STEVENS NON-CUTTING ROLLS

The power will also be supplied by the SMITH Co. It is intended to make this a MODEL CENTRIFUGAL ALL ROLLER MILL, open to the inspection of the world. Competitors for placing the rolls in this mill appeared from *Milwaukee, Indianapolis, Grand Rapids*, and many other points, but the award was made solely upon the acknowledged merits of our rolls for their CAPACITY, QUALITY OF WORK PRODUCED, HORIZONTAL AND PERPENDICULAR ADJUSTMENTS, FEEDING DEVICE, and general substantial appearance and worth. Success is the true test of merit.

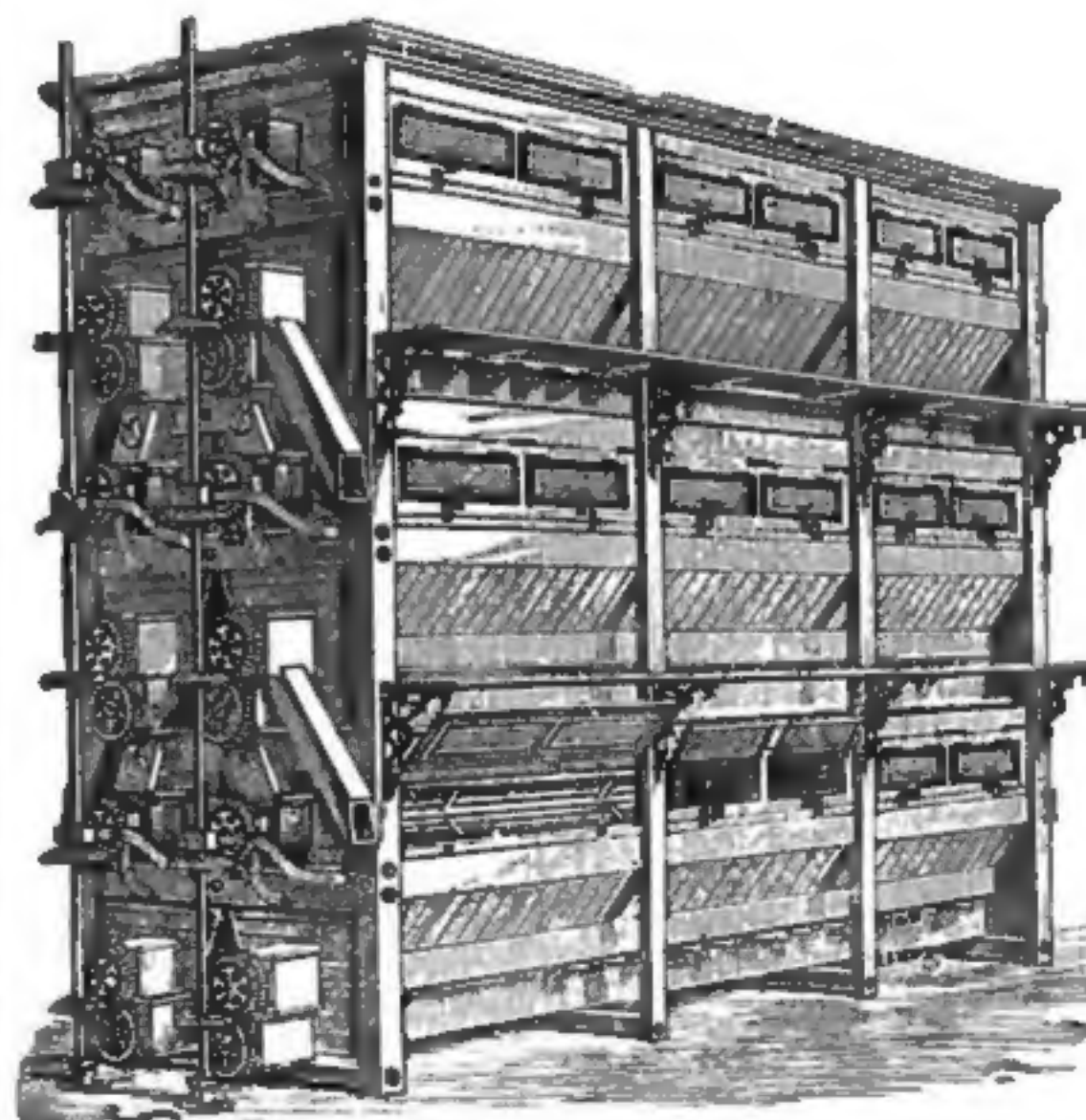
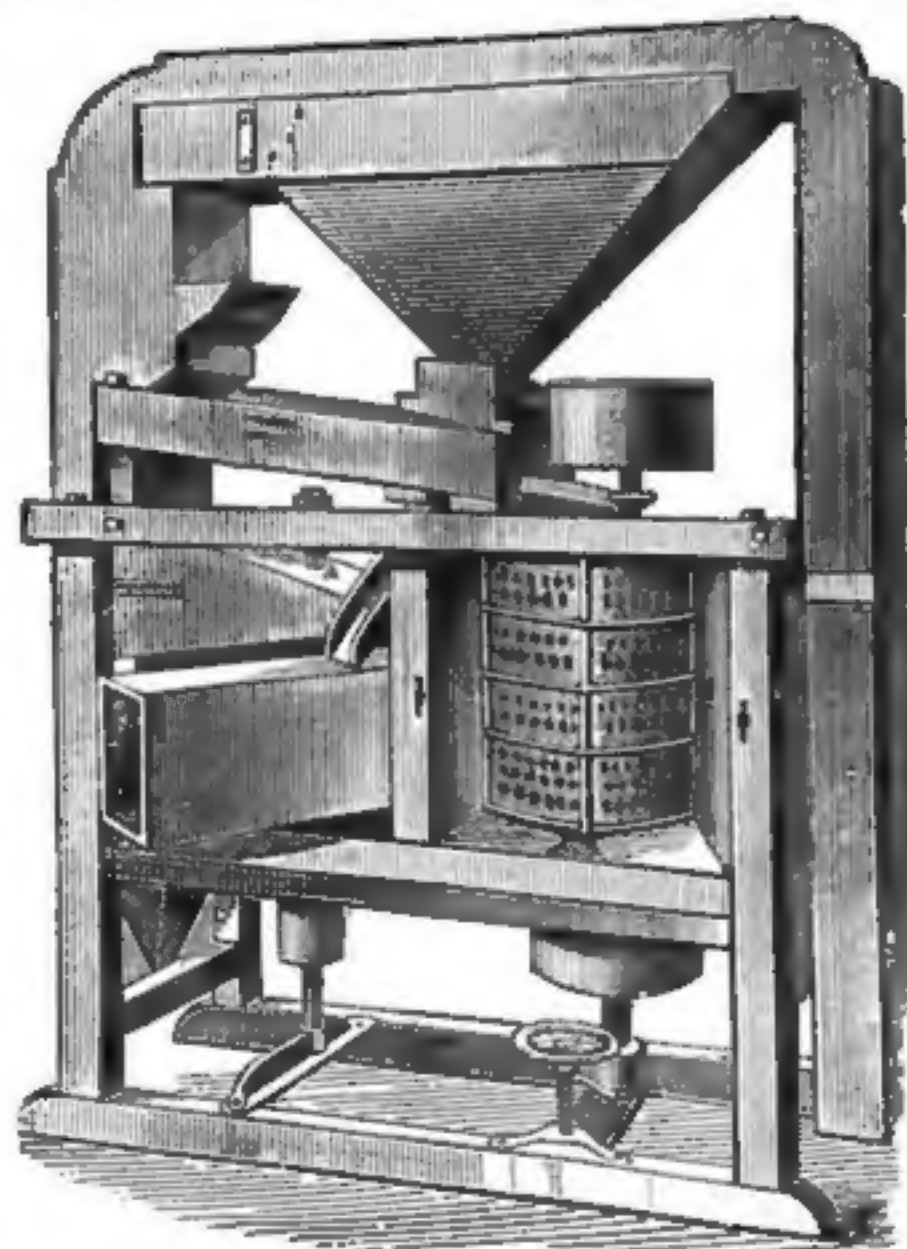
THE JOHN T. NOYE MFG. CO., BUFFALO, N. Y., U. S. A.

TRIMMER'S Improved Adjustable GRAIN RUBBING, POLISHING —AND— SEPARATING MACHINE COMBINED.

It will clean, rub and separate wheat, and take out the rat balls, black seed, joints of straws, cockle and other impurities. It will also rub off more fuzzy ends and dust from the creases of the berries, by rubbing the wheat together as it passes up between the rubbers, so each berry must get rubbed, scoured, and polished alike. It will do all of this work better and last longer than any other machine of the kind. All this we guarantee. It will also clean barley and rye.

SEND FOR DESCRIPTION & PRICE LIST.

Kreider, Campbell & Co.
MILLWRIGHTS & MACHINISTS,
1030 Germantown Avenue, Philadelphia, Penn



RICHMOND CITY MILL WORKS,

MANUFACTURERS OF AND DEALERS IN

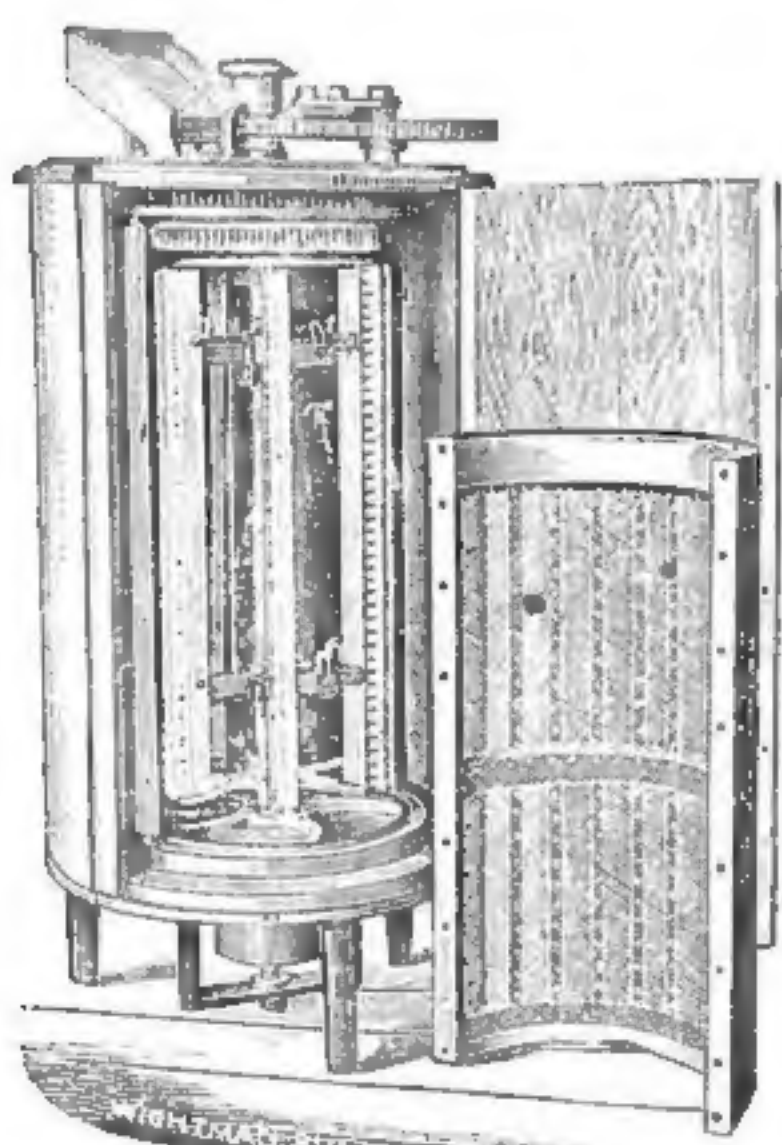
Impr'ed Milling MACHINERY

AND

ALL KINDS MILL SUPPLIES

Richmond, Indiana.

SEND FOR CATALOGUE.



GRAIN-CLEANING MACHINERY

My list embraces four sizes of Separators for mills; four sizes for warehouses. Five sizes of Smutters and Separators, and five sizes of Adjustable Brush Smutters and Finishers. Six sizes of Horizontal and seven sizes of Upright Bran-Dusters. These goods are all of my own manufacture and are warranted in every particular. Correspond with me before you place your orders.

CHARLES RAKES, LOCKPORT, N. Y.

I CARRY A FULL LINE OF MILL FURNISHINGS.